ONTARIO
COLLEGE OF PHARMACY
44 GERRARD ST. E.
TORONTO.

PROCEEDINGS

ONTARIO
COLLEGE OF PHARMACY
44 GERRARD ST. E.
TORONTO.

OF THE

AMERICAN

PHARMACEUTICAL ASSOCIATION

AT THE

FORTY-EIGHTH ANNUAL MEETING,

HELD AT

RICHMOND, VA., MAY, 1900.

ALSO THE

CONSTITUTION, BY-LAWS AND ROLL OF MEMBERS.

BALTIMORE:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1900.

INITIAL MEETING AT NEW YORK 1851.
AMERICAN
PHARMACEUTICAL
ASSOCIATION
INCORPORATED AT
WASHINGTON, D.C.
FEB'Y 21.
1888.
ORGANIZED AT PHILADELPHIA-1852.

OFFICERS OF THE ASSOCIATION.

1900-1901.

PRESIDENT.

JOHN F. PATTON . . . . . York, Pa.

FIRST VICE-PRESIDENT.

JAS. H. BEAL . . . . . Scio, O.

SECOND VICE-PRESIDENT.

JNO. W. GAYLE . . . . . Frankfort, Ky.

THIRD VICE-PRESIDENT.

E. A. RUDDIMAN . . . . . Nashville, Tenn.

TREASURER.

SAMUEL A. D. SHEPPARD . . . . . Boston, Mass.

GENERAL SECRETARY.

CHAS. CASPARI, JR. . . . . Baltimore, Md.

REPORTER ON THE PROGRESS OF PHARMACY.

C. LEWIS DIEHL . . . . . Louisville, Ky.

LOCAL SECRETARY.

HENRY M. WHELPLEY . . . . . St. Louis, Mo.

COUNCIL.

MEMBERS OF THE COUNCIL.

Term Expires.		
1901.	The Officers of the Association,	*Ex-officio.*
"	The Chairmen of the Four Sections,	
"	The Secretary of the Council,	
"	Wm. S. Thompson	Washington, D. C.
"	Henry M. Whitney	North Andover Depot, Mass.
"	Jas. M. Good	St. Louis, Mo.
1902.	Chas. E. Dohme	Baltimore, Md.
"	A. B. Prescott	Ann Arbor, Mich.
"	Leo Eliel	South Bend, Ind.
1903.	T. Roberts Baker	Richmond, Va.
"	Lewis C. Hopp	Cleveland, O.
"	Wm. C. Alpers	Bayonne, N. J.

OFFICERS OF THE COUNCIL.

Wm. S. Thompson, Chairman. James M. Good, Vice-Chairman

Geo. W. Kennedy, Secretary.

COMMITTEES OF THE COUNCIL.

On Membership:

H. M. Whelpley, *Chairman*,
Henry M. Whitney,
T. Roberts Baker,
Jas. H. Beal,
Lewis C. Hopp,
Jno. W. Gayle,
E. A. Ruddiman,
Geo. W. Kennedy, *Secretary.*
The Treasurer and General Secretary of the Association, *ex officio.*

On Finance:

Chas. E. Dohme, *Chairman*,
Chas. A. Rapelye.
Henry P. Hynson,

On Publication:

Chas. Caspari, Jr., *Chairman*,
C. Lewis Diehl,
James M. Good,
Leo Eliel,
C. B. Lowe.

On Centennial Fund:

Jno. F. Patton, *Chairman*,
Chas. E. Dohme,
Chas. Caspari, Jr.

Auditing Committee: (Appointed by the Chairman of the Council.)

Chas. A. Rapelye, *Chairman*,
T. R. Shannon,
P. W. Newton.

STANDING COMMITTEES OF THE ASSOCIATION.

COMMITTEE ON TRANSPORTATION.

(Appointed by the Council.)

CHAS. CASPARI, JR. (Chairman) ..... Baltimore, Md.

ALBERT E. EBERT, Chicago, Ill.
CASWELL A. MAYO, New York, N. Y.
CHAS. M. FORD, Denver, Colo.
CHAS. G. MERRELL, Cincinnati, O.
S. A. D. SHEPPARD, Boston, Mass.
GEO. F. PAYNE, Atlanta, Ga.
H. M. WHELPLEY, St. Louis, Mo.
WM. M. SEARBY, San Francisco, Cal.
CHAS. T. HELLER, St. Paul, Minn.
A. K. FINLAY, New Orleans, La.

COMMITTEE ON THE REVISION OF THE U. S. PHARMACOPŒIA.

(Appointed by the President.)

LEO ELIEL (Chairman) ..... South Bend, Ind.

H. V. ARNY, Cleveland, O.
F. W. E. STEDEM, Philadelphia, Pa.
J. O. SCHLOTTERBECK, Ann Arbor, Mich.
WALTER G. DUCKETT, Washington, D. C.

COMMITTEE ON GENERAL PRIZES.

(Appointed by the President.)

CHAS. T. GEORGE (Chairman) ..... Harrisburg, Pa.

C. S. N. HALLBERG, Chicago, Ill.
O. A. Wall, St. Louis, Mo.

COMMITTEE ON THE EBERT PRIZE.

(Appointed by the Chairman of the Section on Scientific Papers.)

E. L. PATCH (Chairman) ..... Boston, Mass.

WM. SIMON, Baltimore, Md.
FRANCIS HEMM, St. Louis, Mo.

COMMITTEE ON SCIENTIFIC PAPERS.

OSCAR OLDBERG (Chairman) ..... Chicago, Ill.

LYMAN F. KEBLER (Secretary), Philadelphia, Pa.
WM. A. PUCKNER, Chicago, Ill.

COMMITTEE ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

CLEMENT B. LOWE (Chairman) ..... Philadelphia, Pa.

JULIUS A. KOCH (Secretary), Pittsburg, Pa.
CHAS. A. WEIDEMANN, Philadelphia, Pa.
JAS. H. BEAL, Scio, O.
CHAS. L. HAY, Du Bois, Pa.

COMMITTEE ON COMMERCIAL INTERESTS.

CHAS. A. RAPELYE (Chairman) ..... Hartford, Conn.

F. W. MEISSNER, JR. (Secretary), La Porte, Ind.
F. E. HOLLIDAY, Topeka, Kan.
F. W. E. STEDEM, Philadelphia, Pa.
HENRY WILLIS, Quebec, Can.

COMMITTEE ON PRACTICAL PHARMACY AND DISPENSING.

HENRY P. HYNSON (Chairman), ... Baltimore, Md.

F. W. E. STEDEM (Secretary), Philadelphia, Pa.
C. LEWIS DIEHL, Louisville, Ky.

SPECIAL COMMITTEES OF THE ASSOCIATION.

(Appointed by the President.)

COMMITTEE ON NATIONAL LEGISLATION.

A. E. Ebert (Chairman) ..... Chicago, Ill.
C. B. Lowe, Philadelphia, Pa.
Wm. S. Thompson, Washington, D. C.
A. B. Lyons, Detroit, Mich.
H. P. Hynson, Baltimore, Md.

COMMITTEE ON SIMULTANEOUS MEETING OF THE A. PH. A. AND THE N. A. R. D.

Henry P. Hynson (Chairman) ..... Baltimore, Md.
James M. Good, St. Louis, Mo.
Lewis C. Hopp, Cleveland, O.

COMMITTEE ON NATIONAL FORMULARY.

C. Lewis Diehl (Chairman) ..... Louisville, Ky.
C. S. N. Hallberg, Chicago, Ill.
Chas. Caspari, Jr., Baltimore, Md.
Wilbur L. Scoville, Boston, Mass.
Wm. C. Alpers, Bayonne, N. J.

AUXILIARY COMMITTEE ON REVISION OF THE NATIONAL FORMULARY.

A. B. Stevens, Ann Arbor, Mich.
C. A. Rapelye, Hartford, Conn.
H. P. Hynson, Baltimore, Md.
F. W. E. Stedem, Philadelphia, Pa.
F. W. Meissner, Jr., La Porte, Ind.
Louis Emanuel, Pittsburg, Pa.
E. G. Eberle, Dallas, Texas.
Edw. Raeuber, Milwaukee, Wis.
Wm. Mittelbach, Boonville, Mo.
Geo. C. Diekman, New York, N. Y.

AUXILIARY COMMITTEE ON MEMBERSHIP.

H. M. Whelpley (Chairman) ..... St. Louis, Mo.

Alabama. A. E. Brown, Mobile.
Arizona. Harry Brisley, Prescott.
Arkansas. W. W. Kerr, Batesville.
California. J. J. B. Argenti, San Francisco.
Colorado. Fred'k Steinbauer, Denver.
Connecticut. Chas. A. Rapelye, Hartford.
Delaware. H. K. Watson, Wilmington.
District of Columbia. S. L. Hilton, Washington.
Florida. Walter I. Woodman, St. Augustine.
Georgia. S. P. Watson, Atlanta.
Idaho. D. E. Smithson, Emmett.
Illinois. H. H. Rogers, Kankakee.
Indiana. Leo Eliel, South Bend.
Iowa. Fletcher Howard, Des Moines.
Kansas. Chas. L. Becker, Ottawa.
Kentucky. C. S. Porter, Somerset.
Louisiana. Wm. M. Levy, New Orleans.
Maine. Edward A. Hay, Portland.
Maryland. Wm. C. Powell, Snow Hill.
Massachusetts. F. M. Harris, Worcester.
Michigan. J. W. T. Knox, Detroit.
Minnesota. F. J. Wulling, Minneapolis.
Missouri. H. M. Pettitt, Carrollton.
Nebraska. A. V. Pease, Fairbury.
Nevada. Wm. A. Brown, Winnemucca.
New Hampshire. J. B. Baril, Manchester.
New Jersey. Geo. W. Parisen, Perth Amboy.

New York. Clay W. Holmes, Elmira.
North Carolina. E. V. Zoeller, Tarboro.
North Dakota. Herbert E. White, Jamestown.
Ohio. Geo. B. Kauffman, Columbus.
Oregon. Louis Blumauer, Portland.
Pennsylvania. J. A. Koch, Pittsburg.
Rhode Island. Jas. O'Hare, Providence.
South Carolina. O. E. Thomas, Columbia.
South Dakota. David F. Jones, Watertown.
Tennessee. A. B. Rains, Columbia.
Texas. E. G. Eberle, Dallas.
Utah. Fred. J. Hill, Salt Lake City.
Vermont. Collins Blakely, Montpelier.
Virginia. A. E. G. Klor, Newport News.
Washington. Sophus Joergensen, La Conner.
West Virginia. Wm. H. Williams, Wheeling.
Wisconsin. H. C. Schrank, Milwaukee.
Province of Manitoba. Chas. Flexon, Winnipeg.
Province of Nova Scotia. F. C. Simson, Halifax.
Province of Ontario. Henry Watters, Ottowa.
Province of Quebec. R. W. Williams, Three Rivers.
City of Baltimore. A. R. L. Dohme.
City of Boston. W. L. Scoville.
City of Brooklyn. W. C. Anderson.
City of Chicago. Andrew Scherer.
City of Cincinnati. Albert Wetterstroem.
City of Cleveland. Geo. W. Voss.
City of Detroit. Joseph Helfman.
City of Louisville. O. C. Dilly.
City of Montreal. J. E. Morrison.
City of New Orleans. F. C. Godbold.
City of New York. Chas. S. Erb and R. R. Lampa.
City of Philadelphia. F. W. E. Stedem.
City of St. Louis. H. F. Hassebrock.
City of St. Paul. Chas. T. Heller.
City of Minneapolis. A. D. Thompson.
Army and Navy of the U. S. W. H. Huntington.

COMMITTEE ON WEIGHTS AND MEASURES.

FRANK G. RYAN (Chairman) ..... Detroit, Mich.

Alabama. Gustavus A. Knabe, Montgomery.
Arizona. Harry Brisley, Prescott.
Arkansas. E. F. Klein, Hot Sprmgs.
California. John H. Dawson, San Francisco.
Colorado. F. Ramaley, Boulder.
Connecticut. J. C. Nichols, New London.
Delaware. H. K. Watson, Wilmington.
Dist. Columbia. W. H. Bradbury, Washington.
Florida. L. S. Smith, St. Augustine.
Georgia. H. R. Slack, La Grange.
Idaho. David E. Smithson, Emmett.
Illinois. C. S. N. Hallberg, Chicago.
Indiana. Frank H. Carter, Indianapolis.
Iowa. Jno. L. Etzel, Clear Lake.
Kansas. B. W. Woodward, Lawrence.
Kentucky. Gordon L. Curry, Louisville.
Louisiana. J. A. Legendre, New Orleans.
Maine. G. W. Dorr, Waterville.
Maryland. A. J. Corning, Baltimore.
Massachusetts. F. T. Drake, Stoneham.
Michigan. A. B. Stevens, Ann Arbor.
Minnesota. H. Gordon Webster, Minneapolis.
Missouri. A. Brandenberger, Jefferson City.
Nebraska. N. A. Kuhn, Omaha.
Nevada. W. A. Brown, Winnemucca.
N. Hampshire. S. Howard Bell, Derry Depot.
New Jersey. Chas. F. Dare, Bridgeton.
New York. A. B. Huested, Albany.
N. Carolina. J. H. Hardin, Wilmington.
North Dakota. L. Christianson, Fargo.
Ohio. E. R. Selzer, Cleveland.
Oregon. G. C. Blakely, The Dalles.
Pennsylvania. Wallace Procter, Philadelphia.
Rhode Island. A. W. Fenner, Jr., Providence.
South Carolina. Henry C. Plenge, Charleston.
South Dakota. Lyman T. Dunning, Sioux Falls.

Tennessee.	Chas. M.Greve,Chattanooga.
Texas.	G. J. F. Schmitt, San Antonio.
Vermont.	W. F. Root, Brattleboro.
Virginia.	C. G. Maphis, Charlottesville.
Washington.	G. H. Watt, Pullman.
W. Virginia.	Wm. H. Williams, Wheeling.
Wisconsin.	H. J. Ruenzel, Milwaukee.

COMMITTEE ON STATUS OF PHARMACISTS IN THE ARMY, NAVY AND MARINE HOSPITAL SERVICE OF THE UNITED STATES.

GEO. F. PAYNE (Chairman) ..... Atlanta, Ga.

Alabama.	P. C. Candidus, Mobile.
Arizona.	Harry Brisley, Prescott.
Arkansas.	Wm. L. Dewoody, Pine Bluff.
California.	Wm. M. Searby, San Francisco.
Colorado.	Chas. M. Ford, Denver.
Connecticut.	Jas. T. Eagny, New Haven.
Delaware.	H. K. Watson, Wilmington.
Dist.Columbia.	H. A. Johnston, Washington.
Florida.	Geo. W. Fisher, De Land.
Georgia.	Geo. F. Payne, Atlanta.
Idaho.	David E. Smithson, Emmett.
Illinois.	Paul J. Behrens, Chicago.
Indiana.	Chas. D. Knoefel, New Albany.
Iowa.	John K. Pickett, Oskaloosa.
Kansas.	Henry W. Mehl, Leavenworth.
Kentucky.	W. H. Averill, Frankfort.
Louisiana.	Walter T. Taylor, New Orleans.
Maine.	Frank R. Partridge, Augusta.
Maryland.	Arthur A.Quandt,Baltimore.
Massachusetts.	Chas. L. Davis, Newburyport.
Michigan.	Wm. A. Hall, Detroit.
Minnesota.	W. A. Frost, St. Paul.
Mississippi.	John A. Shreve, Port Gibson.
Missouri.	O. W. Krueger, Kansas City.
Nebraska,	C. R. Sherman, Omaha.
Nevada.	Wm. A. Brown, Winnemucca.
N.Hampshire.	Jno. C. Hurd, Somersworth.
New Jersey.	Clarence P. Smith, Newark.
New York.	Geo. J. Seabury, New York.
North Carolina.	Parry W. Vaughan, Durham.
North Dakota.	H. L. Haussamen, Grafton.
Ohio.	Chas. E. Ink, Columbiana.
Oregon.	Eugene A. Sherwin, Ashland.
Pennsylvania.	Louis Emanuel, Pittsburg.
Rhode Island.	W. O. Blanding, Providence.
South Carolina.	A. B. Carpenter, Greenville.
South Dakota.	Fred'k. A. Brecht, Yankton.
Tennessee.	J. C. Treherne, Memphis.
Texas.	I. F. Orton, Galveston.
Vermont.	Albert W. Higgins, Rutland.
Virginia.	Wm. G. Burgess, Newport News.
Washington.	Henry E. Holmes, Seattle.
West Virginia.	Wm. H. Williams, Wheeling.
Wisconsin.	R. A. Sauerhering, Mayville.

DELEGATES TO THE SECTION ON MATERIA MEDICA, PHARMACY AND THERAPEUTICS OF THE AMERICAN MEDICAL ASSOCIATION.

F. J. WULLING (Chairman) ..... Minneapolis, Minn.

E. Floyd Allen, Minneapolis, Minn.
Wm. A. Frost, St. Paul, Minn.
Chas. T. Heller, St. Paul, Minn.
Sam'l F. Boyce, Duluth, Minn.
A. B. Prescott, Ann Arbor, Mich.
E. M. Houghton, Detroit, Mich.
F. E. Stewart, New York, N. Y.
S. E. Jelliffe, New York, N. Y.
H. K. Mulford, Philadelphia, Pa.
H. R. Slack, La Grange, Ga.
C. H. G. Klie. St. Louis, Mo.
F. S. Hereth, Chicago, Ill.
W. M. Sempill, Chicago, Ill.
G. M. Beringer, Camden, N. J.

DELEGATES TO THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

ALBERT E. EBERT (Chairman) ..... Chicago, Ill.

Paul G. Schuh, Cairo, Ill.
Henry Biroth, Chicago, Ill.
Robert M. Dadd, Milwaukee, Wis.
Thos. Layton, St. Louis, Mo.

DELEGATES TO THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

WM. A. HALL (Chairman) ..... Detroit, Mich.

Wm. L. Cliffe, Philadelphia, Pa.
James Vernor, Detroit, Mich.
E. R. Selzer, Cleveland, O.
O. Eberbach, Ann Arbor, Mich.

DELEGATES TO THE NATIONAL PURE FOOD AND DRUG CONGRESS.

LEWIS C. HOPP (Chairman) ..... Cleveland, O.

Lewis Flemer, Washington, D. C.
Wm. McIntyre, Philadelphia, Pa.
Herbert C. Easterday, Washington, D. C.
Wm. H. Scott, Richmond, Va.

COMMITTEE OF ARRANGEMENTS FOR THE MEETING OF 1901.

(Appointed by the Local Secretary, as Chairman, in accordance with a resolution of the Association, adopted May 12, 1900.)

HENRY M. WHELPLEY (Chairman) ..... St. Louis, Mo.

Solomon Boehm, St. Louis, Mo.
James M. Good, "
H. F. Hassebrock, "
Francis Hemm, "
Thomas Layton, "
C. F. G. Meyer, St. Louis, Mo.
M. J. Noll, "
Enno Sander, "
H. F. A. Spilker, "
O. A. Wall, "

LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION.

(DECEASED IN ITALICS.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852..	Philadelphia, Pa....	*Daniel B. Smith*, Philadelphia.	*George W. Andrews*, Baltimore.	*Samuel M. Colcord*, Boston.	*C. Augustus Smith*, Cincinnati.
Aug. 24, 1853..	Boston, Mass.....	*William A. Brewer*, Boston.	*George D. Coggeshall*, New York.	*Alexander Duval*, Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854..	Cincinnati, O.....	*William B. Chapman*, Cincinnati.	Henry T. Cummings, Portland, Me.	*John Meakim*, New York.	*Joseph Laidley*, Richmond, Va.
Sept. 11, 1855..	New York, N. Y....	*John Meakim*, New York.	Charles B. Guthrie, Memphis, Tenn.	*Charles Ellis*, Philadelphia.	*Henry F. Fish*, Waterbury, Conn.
Sept. 9, 1856..	Baltimore, Md.....	*George W. Andrews*, Baltimore.	*John L. Kidwell*, Washington, D. C.	Frederick Stearns, Detroit, Mich.	*Henry T. Kiersted*, New York, N. Y.
Sept. 8, 1857..	Philadelphia, Pa. ...	*Charles Ellis*, Philadelphia.	*James Cooke*, Fredericksburg, Va.	*Samuel P. Peck*, Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858..	Washington, D. C...	*John L. Kidwell*, Georgetown, D. C.	*Edward R. Squibb*, Brooklyn, N. Y.	*James O'Gallagher*, St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859..	Boston, Mass.....	*Samuel M. Colcord*, Boston.	*William Procter, Jr.*, Philadelphia.	*Joseph Roberts*, Baltimore.	Edwin O. Gale, Chicago.
Sept. 11, 1860..	New York, N. Y....	*Henry T. Kiersted*, New York.	William J. M. Gordon, Cincinnati.	*William S. Thompson*, Baltimore.	*Theodore Metcalf*, Boston.
Aug. 27, 1862..	Philadelphia, Pa. ...	*William Procter, Jr.*, Philadelphia.	*John Milhau*, New York.	*Eugene L. Massol*, St. Louis.	*J. Faris Moore*, Baltimore.
Sept. 8, 1863..	Baltimore, Md.....	*J. Faris Moore*, Baltimore.	*John M. Maisch*, Philadelphia.	*Chas. A. Tufts*, Dover, N. H.	*George W. Weyman*, Pittsburg.
Sept. 21, 1864..	Cincinnati, O.....	William J. M Gordon, Cincinnati.	*Richard H. Stabler*, Alexandria, Va.	Enno Sander, St. Louis.	*Thomas Hollis*, Boston.

LIST OF OFFICERS (Continued.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1865..	Boston, Mass.....	*Henry W. Lincoln*, Boston.	*George C. Close*, Brooklyn, N. Y.	*Elijah W. Sackrider*, Cleveland, O.	*Charles A. Heinitsh*, Lancaster, Pa.
Aug. 22, 1866..	Detroit, Mich.....	Frederick Stearns, Detroit, Mich.	*Edward Parrish*, Philadelphia.	Ezekiel H. Sargent, Chicago.	*John W. Shedden*, New York.
Sept. 10, 1867..	New York, N. Y.....	*John Milhau*, New York.	*Robert J. Brown*, Leavenworth, Kan.	*N. Hynson Jennings*, Baltimore.	*Daniel Henchman*, Boston.
Sept. 8, 1868..	Philadelphia, Pa....	*Edward Parrish*, Philadelphia.	*Ferris Bringhurst*, Wilmington, Del.	*Edward S. Wayne*, Cincinnati.	Albert E. Ebert, Chicago.
Sept. 7, 1869..	Chicago, Ill.....	Ezekiel H. Sargent, Chicago.	*Ferdinand W. Sennewald*, St. Louis.	*John H. Pope*, New Orleans.	Joel S. Orne, Cambridgeport, Mass.
Sept. 13, 1870..	Baltimore, Md.....	*Richard H. Stabler*. Alexandria, Va.	Fleming G. Grieve, Milledgeville, Ga.	James G. Steele, San Francisco.	*Eugene L. Massot*, St. Louis.
Sept. 12, 1871..	St. Louis, Mo	Enno Sander, St. Louis.	C. Lewis Diehl, Louisville, Ky.	*George F. H. Markoe*, Boston.	*Matthew F. Ash*, Jackson, Miss.
Sept. 3, 1872..	Cleveland, O.	Albert E. Ebert, Chicago.	*Samuel S. Garrigues*, East Saginaw, Mich.	Edward P. Nichols, Newark, N. J.	*Henry C. Gaylord*, Cleveland, O.
Sept. 16, 1873..	Richmond, Va.....	John F. Hancock, Baltimore.	William Saunders, London, Ont.	John T. Buck, Jackson, Miss.	*Paul Balluff*, New York.
Sept. 8, 1874..	Louisville, Ky.....	C. Lewis Diehl, Louisville, Ky.	*Joseph Roberts*, Baltimore.	William T. Wenzell, San Francisco.	*Augustus R. Bayley*, Cambridgeport, Mass.
Sept. 7, 1875..	Boston, Mass.....	*George F. H. Markoe*, Boston.	Frederick Hoffmann, New York.	T. Roberts Baker, Richmond, Va.	Christian F. G. Meyer, St. Louis.
Sept. 12, 1876..	Philadelphia, Pa....	*Charles Bullock*, Philadelphia.	Samuel A. D. Sheppard, Boston.	*Gustavus J. Luhn*, Charleston, S. C.	*Jacob D. Wells*, Cincinnati.
Sept. 4, 1877..	Toronto, Can.....	William Saunders, London, Ont.	Ewen McIntyre, New York.	*John Ingalls*, Macon, Ga.	*Emlen Painter*, San Francisco.

LIST OF OFFICERS (Continued.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Nov. 26, 1878..	Atlanta, Ga.....	*Gustavus J. Luhn*, Charleston, S. C.	*Frederick T. Whiting*, Great Barrington, Mass.	Henry J. Rose, Toronto, Can.	*William H. Crawford*, St. Louis.
Sept. 9, 1879..	Indianapolis, Ind. ..	George W. Sloan, Indianapolis, Ind.	T. Roberts Baker, Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	Philip C. Candidus, Mobile, Ala.
Sept. 14, 1880..	Saratoga, N. Y.	James T. Shinn, Philadelphia.	George H. Schafer, Fort Madison, Ia.	William S. Thompson, Washington, D. C.	William Simpson, Raleigh, N. C.
Aug. 23, 1881..	Kansas City, Mo....	*P. Hendover Bedford*, New York.	*Emlen Painter*, San Francisco.	George Leis, Lawrence, Kan.	*John F. Judge*, Cincinnati.
Sept. 12, 1882..	Niagara Falls, N. Y..	*Charles A. Heinitsh*. Lancaster, Pa.	*John Ingalls*, Macon, Ga.	Louis Dohme, Baltimore.	*William B. Blanding*, Providence, R. I.
Sept. 11, 1883..	Washington, D. C...	William S. Thompson, Washington, D. C.	Charles Rice, New York.	*Frederick H. Masi*, Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884..	Milwaukee, Wis	*John Ingalls*, Macon, Ga.	*John A. Dadd*, Milwaukee, Wis.	Henry Canning, Boston, Mass.	*Charles F. Goodman*, Omaha, Neb.
Sept. 8, 1885..	Pittsburgh, Pa.....	*Joseph Roberts*, Baltimore, Md.	Albert H. Hollister, Madison, Wis.	Albert B. Prescott, Ann Arbor, Mich.	Joseph S. Evans, West Chester, Pa.
Sept. 7, 1886..	Providence, R. I....	*Chas. A. Tufts*, Dover, N. H.	*Henry J. Menninger*, Brooklyn, N. Y.	*M. W. Alexander*, St. Louis, Mo.	Norman A. Kuhn, Omaha, Neb.
Sept. 5, 1887..	Cincinnati, O.....	John U. Lloyd, Cincinnati, O.	*M. W. Alexander*, St. Louis, Mo.	A. K. Finlay, New Orleans, La.	Karl Simmon, St. Paul, Minn.
Sept. 3, 1888..	Detroit, Mich	*M. W. Alexander*, St. Louis, Mo.	Jas. Vernor, Detroit, Mich.	*Fred. Wilcox*, Waterbury, Conn.	Alvin A. Yeager, Knoxville, Tenn.
June 24, 1889..	San Francisco, Cal..	*Emlen Painter*, New York.	Karl Simmon, St. Paul, Minn.	Wm. M. Searby, San Francisco.	Jos. W. Eckford, Aberdeen, Miss.
Sept. 8, 1890..	Old Pt. Comfort, Va.	*A. B. Taylor*, Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	Chas. E. Dohme, Baltimore, Md.	Jas. M. Good, St. Louis, Mo.

LIST OF OFFICERS (Concluded.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
April 27, 1891..	New Orleans, La....	A. K. Finlay, New Orleans, La.	Geo. J. Seabury, New York, N. Y.	W. H. Torbert, Dubuque, Ia.	L. T. Dunning, Sioux Falls, S. Dak.
July 14, 1892..	Profile House, N. H.	Jos. P. Remington, Philadelphia.	A. P. Preston, Portsmouth, N. H.	Sidney P. Watson, Atlanta, Ga.	Wm. H. Averill, Frankfort, Ky.
Aug. 14, 1893..	Chicago, Ill.....	Edgar L. Patch, Boston.	Leo Eliel, South Bend, Ind.	Wiley Rogers, Louisville, Ky.	Chas. Caspari, Jr., Baltimore, Md.
Sept. 3, 1894..	Asheville, N. C.	William Simpson, Raleigh, N. C.	Chas. M. Ford, Denver, Colo.	Jno. N. Hurty, Indianapolis, Ind.	Jos. E. Morrison, Montréal, Can.
Aug. 14, 1895..	Denver, Colo.....	James M. Good, St. Louis, Mo.	Chas. E. Dohme, Baltimore, Md.	Adolph Brandenberger, Jefferson City, Mo.	Mrs. M. O. Miner, Hiawatha, Kan.
Aug. 12, 1896..	Montreal, Can	Joseph E. Morrison, Montreal, Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parisen, Perth Amboy, N. J.
Aug. 23, 1897..	Lake Minnetonka, Minn	Henry M. Whitney, Lawrence, Mass.	George C. Bartells, Camp Point, Ills.	Wm. S. Thompson, Washington, D. C.	Jacob A. Miller, Harrisburg, Pa.
Aug. 29, 1898..	Baltimore, Md	Charles E. Dohme, Baltimore, Md.	George F. Payne, Atlanta, Ga.	James H. Beal, Scio, O.	Miss Josie A. Wanous, Minneapolis, Minn.
Sept. 4, 1899..	Put-in-Bay, O	Albert B. Prescott, Ann Arbor, Mich.	Lewis C. Hopp, Cleveland, O.	Wm. L. Dewoody, Pine Bluff, Ark.	Henry R. Gray, Montreal, Can.
May 7, 1900 ...	Richmond, Va.	Jno. F. Patton, York, Pa.	James H. Beal, Scio, O.	Jno. W. Gayle, Frankfort, Ky.	E. A. Ruddiman, Nashville, Tenn.

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852–54.
Samuel M. Colcord, Boston, 1854–56, and 1857–59.
James S. Aspinwall, New York, 1856–57.
Ashel Boyden, Boston, 1859–60.
Henry Haviland, New York, 1860–63.
J. Brown Baxley, Baltimore, 1863–65.
Charles A. Tufts, Dover, N. H., 1865–86.
Samuel A. D. Sheppard, Boston, 1886–1901.

George D. Coggeshall, New York, 1852–53.
Edward Parrish, Philadelphia, 1853–54.
Edward S. Wayne, Cincinnati, 1854–55.
William J. M. Gordon, Cincinnati, 1855–59.

William Procter, Jr., 1852–53, and 1854–57.
William B. Chapman, Cincinnati, 1853–54.

John M. Maisch, Philadelphia, 1865–Sept., 1893.

RECORDING SECRETARIES.

Charles Bullock, Philadelphia, 1859–60.
James T. Shinn, Philadelphia, 1860–62.
Peter W. Bedford, New York, 1862–63.
William Evans, Jr., Philadelphia, 1863–64.
Henry N. Rittenhouse, Philadelphia, 1864–65.
H. M. Whelpley, St. Louis, 1893.

CORRESPONDING SECRETARIES.

Edward Parrish, Philadelphia, 1857–58.
Ambrose Smith, Philadelphia, 1858–59.
William Hegeman, New York, 1859–60.
Peter W. Bedford, New York, 1860–62, and 1863–65.
John M. Maisch, Philadelphia, 1862–63.

PERMANENT SECRETARIES.

Henry M. Whelpley, St. Louis (acting), August, 1893.
Joseph P. Remington, Philadelphia, 1893–94.
Chas. Caspari, Jr., Baltimore, 1894–96.

GENERAL SECRETARY.

Chas. Caspari, Jr., Baltimore, 1896–1901.

LOCAL SECRETARIES.

For the meeting held in		For the meeting held in		For the meeting held in	
1867	*P. Wendover Bedford.*	1879	*Eli Lilly.*	1891	A. K. Finlay.
1868	*Alfred B. Taylor.*	1880	Charles F. Fish.	1892	H. M. Whitney.
1869	*Henry W. Fuller.*	1881	William T. Ford.	1893	Henry Biroth.
1870	*J. Faris Moore.*	1882	*Hiram E. Griffith.*	1894	W. G. Smith.
1871	*William H. Crawford.*	1883	Charles Becker.	1895	Edm. L. Scholtz.
1872	*Henry C. Gaylord.*	1884	Henry C. Schranck.	1896	Joseph E. Morrison.
1873	Thomas H. Hazard.	1885	George A. Kelly.	1897	Edw. Shumpik.
1874	Emil Scheffer.	1886	*William B. Blanding.*	1898	Henry P. Hynson.
1875	Samuel A. D. Sheppard.	1887	George W. Voss.	1899	Lewis C. Hopp.
1876	Adolphus W. Miller.	1888	James Vernor.	1900	T. Ashby Miller.
1877	Henry J. Rose.	1889	Edward W. Runyon.	1901	H. M. Whelpley.
1878	*Jesse W. Rankin.*	1890	Charles E. Dohme.		

REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873–91, and 1895–1901. Chas. Rice, New York, N. Y., 1891–92. Henry Kraemer, New York, N. Y., 1892–95.

OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

	Chairman.	*Vice-Chairman.*	*Secretary.*
1880–81	Jos. P. Remington.	*Joseph Roberts.*	Geo. W. Kennedy.
1881–82	" "	Wm. J. M. Gordon.	" "
1882–83	" "	" "	" "
1883–84	" "	C. Lewis Diehl.	" "
1884–85	" "	*John A. Dadd.*	" "
1885–86	" "	C. Lewis Diehl.	" "
1886–87	Wm. S. Thompson.	*H. J. Menninger.*	" "
1887–88	Wm. H. Rogers.	Karl Simmon.	" "
1888–89	Jas. M. Good.	*Emlen Painter.*	" "
1889–90	" "	Wm. S. Thompson.	" "
1890–91	" "	" "	" "
1891–92	" "	" "	" "
1892–93	" "	H. M. Whitney.	" "
1893–94	" "	" "	" "
1894–95	Wm. S. Thompson.	" "	" "
1895–96	" "	Wm. C. Alpers.	" "
1896–97	" "	Jas. M. Good.	" "
1897–98	" "	" "	" "
1898–99	" "	" "	" "
1899–00	" "	" "	" "
1900–01	" "	" "	" "

PAST AND PRESENT OFFICERS OF THE SECTIONS.

Section on Commercial Interests.

	Chairman.	*Secretary.*
1887–88	A. H. Hollister.	*J. M. Colcord.*
1888–89	" "	" "
1889–90	Leo Eliel.	F. B. Kilmer.
1890–91	Henry Canning.	W. L. Dewoody.
1891–92	W. H. Torbert.	Arthur Bassett.
1892–93	" "	" "
1893–94	Wiley Rogers.	Jas. O. Burge.
1894–95	Geo. J. Seabury.	" "
1895–96	" "	Clay W. Holmes.
1896–97	Lewis C. Hopp.	E. D'Avignon.
1897–98	Joseph Jacobs.	Jas. H. Bobbitt.
1898–99	" "	" "
1899–00	Jas. M. Good.	Chas. A. Rapelye.
1900–01	Chas. A. Rapelye,	F. W. Meissner, Jr.

Section on Scientific Papers.

	Chairman.	*Secretary.*
1887–88	T. Roberts Baker.	A. B. Lyons.
1888–89	*Emlen Painter.*	H. M. Whelpley.
1889–90	H. M. Whelpley.	C. F. Dare.
1890–91	E. L. Patch.	C. S. N. Hallberg.
1891–92	C. S. N. Hallberg.	H. W. Snow.
1892–93	C. T. P. Fennel.	F. G. Ryan.
1893–94	L. E. Sayre.	C. M. Ford.
1894–95	A. R. L. Dohme.	Geo. B. Kauffman.
1895–96	S. P. Sadtler.	W. C. Alpers.
1896–97	W. C. Alpers.	V. Coblentz.
1897–98	Edward Kremers.	A. B. Lyons.

Section on Scientific Papers.—*Con.*

	Chairman.	*Secretary.*
1898–99	Henry H. Rusby.	H. V. Arny.
1899–00	Frank G. Ryan.	Caswell A. Mayo.
1900–01	Oscar Oldberg.	Lyman F. Kebler.

Section on Pharmaceutical Education.

	Chairman.	*Secretary.*
1887–88	*John F. Judge.*	H. M. Whelpley.
1888–89	*P. W. Bedford.*	L. E. Sayre.

Section on Pharmaceutical Legislation.

	Chairman.	*Secretary.*
1887–88	R. F. Bryant.	W. P. De Forest.
1888–89	C. W. Day.	J. N. Hurty.

Section on Pharmaceutical Education and Legislation.

	Chairman.	*Secretary.*
1889–90	*P. W. Bedford.*	A. B. Stevens.
1890–91	Wm. Simon.	L. C. Hogan.
1891–92	A. B. Stevens.	" "
1892–93	R. G. Eccles.	" "
1893–94	" "	" "
1894–95	Jas. M. Good.	C. S. N. Hallberg.
1895–96	C. S. N. Hallberg.	Jas. H. Beal.
1896–97	" "	" "
1897–98	Jas. H. Beal.	H. Gordon Webster.
1898–99	A. B. Lyons.	C. B. Lowe.
1899–00	C. B. Lowe.	J. A. Koch.
1900–01	" "	" "

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President in compliance with the following resolutions:

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That whilst it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

Alabama,	Albert E. Brown, 14 N. Water St.,	Mobile.
Arkansas,	John B. Bond, Main and Fifth streets,	Little Rock.
	William L. Dewoody,	Pine Bluff.
California,	William T. Wenzell, 436 Oak street,	San Francisco.
	George B. Flint, 1101 Broadway,	Oakland.
Dist. of Columbia,	Walter G. Duckett, 22d st. and Penna. ave.,	Washington.
Connecticut,	John K. Williams, 391 Main street,	Hartford.
	Warren A. Spalding, 19 Church street,	New Haven.
Delaware,	Herbert K. Watson, 803 Market St.,	Wilmington.
Georgia,	Robert H. Land, 812 Broad street,	Augusta.
	Thomas A. Cheatham, Mulberry & 3d Sts.,	Macon.
	Sidney P. Watson, 137 Richardson street,	Atlanta.
Idaho,	David E. Smithson,	Emmett, Canyon Co.
Illinois,	C. S. N. Hallberg, 358 Dearborn St.,	Chicago.
	Henry Biroth, 481 25th St.,	Chicago.
Indiana,	Henry J. Schlaepfer, Second and Main streets,	Evansville.
	Frank H. Carter, 772 Massachusetts avenue,	Indianapolis.
Iowa,	John W. Ballard, 106 West Second street,	Davenport.
	George H. Schafer, 713 Front street,	Fort Madison.
	Silas H. Moore, 525 Fourth street,	Sioux City.

Kansas,	George Leis, 747 Massachusetts street,	Lawrence.
Kentucky,	William H. Averill, 435 Main street,	Frankfort.
	C. Lewis Diehl, Third street and Broadway,	Louisville.
Louisiana,	Alexander K. Finlay, 186 Camp street,	New Orleans.
Maine,	Noah S. Harlow, 4 Smith's Block,	Bangor.
	Edward A. Hay, Free and Middle sts.,	Portland.
Maryland,	D. M. R. Culbreth, 203 E. Preston street,	Baltimore.
Massachusetts,	S. A. D. Sheppard, 1129 Washington street,	Boston.
	Joel S. Orne, 493 Main street,	Cambridgeport.
	B. Frank Stacey, Thompson Square,	Charlestown.
	Freeman H. Butler, 141 Central street,	Lowell.
	James E. Blake, 64 North Second street,	New Bedford.
	John H. Manning, 51 North street,	Pittsfield.
	Thomas B. Nichols, 178 Essex street.	Salem.
	Francis M. Harris, 814 Main street,	Worcester.
Michigan,	Ottmar Eberbach, 12 South Main street,	Ann Arbor.
	James Vernor. 235 Woodward avenue,	Detroit.
Minnesota,	Wm. A. Frost, cor. Selby & Western aves.,	St. Paul.
	H. Gordon Webster, 15 Washington ave., W..	Minneapolis.
Mississippi,	Joseph W. Eckford, Commerce street,	Aberdeen.
Missouri,	James M. Good, 2348 Olive street,	St. Louis.
	George Eyssell, 1036 Union ave.,	Kansas City.
Nebraska,	Autumn V. Pease,	Fairbury.
New Hampshire,	Andrew P. Preston, 2 Congress Block,	Portsmouth.
New Jersey,	Wm. M. Oliver, 132 Broad street,	Elizabeth.
	Hermann Klussmann, 110 First st.,	Hoboken.
	Maxwell Abernethy, 188 Newark avenue,	Jersey City.
	Charles B. Smith, 861 Broad street,	Newark.
	Howard P. Reynolds, 71 Washington ave., N.,	Plainfield.
New York,	Charles H. Gaus, 202 Washington avenue,	Albany.
	Rudolf C. Werner, 2592 Atlantic ave.,	Brooklyn.
	Charles O. Rano, 1872 Niagara street,	Buffalo.
	William L. Du Bois, 281 Main street,	Catskill.
	John Hepburn, 103 Main street,	Flushing.
	Harvey G. Goodale, P. O. Box 29,	Jamaica.
	James T. King, Main and South streets,	Middletown.
	John McKesson, Jr., 91 Fulton street,	New York.
	Charles F. Fish, 348 Broadway,	Saratoga.
	Charles W. Snow, 214 Warren street,	Syracuse.
	William Blaikie, 202 Genesee street,	Utica.
North Carolina,	William Simpson, 101 Fayetteville street,	Raleigh.
	John H. Hardin, 124 South Front street,	Wilmington.
North Dakota,	Henry L. Haussamen,	Grafton.
Ohio,	J. U. Lloyd, Court and Plum streets,	Cincinnati.
	George L. Hechler, 1099 Broadway,	Cleveland.
	Charles Huston, 47 South High street,	Columbus.
	Thomas J. Casper, 41 East Main street,	Springfield.
Oregon,	Louis Blumauer, Fourth and Morrison streets,	Portland.
Pennsylvania,	Jacob A. Miller, Second and Chestnut streets,	Harrisburg.
	Joseph L. Lemberger, 5 North Ninth street,	Lebanon.
	Richard M. Shoemaker, Fourth and Race streets,	Philadelphia.

Pennsylvania,	Philip M. Ziegler, 526 Penn street,	Reading.
	Edward A. Cornell, Fourth and Pine streets,	Williamsport.
South Carolina,	Oscar E. Thomas, 164 Main street,	Columbia.
Tennessee,	Jas. S. Robinson, Second and Madison streets,	Memphis.
	James O. Burge, Church and High streets,	Nashville.
Texas,	Geo. J. F. Schmitt, 507 W. Commerce street,	San Antonio.
Virginia,	T. Roberts Baker, 3101 East Main street,	Richmond.
Washington,	Henry E. Holmes,	Seattle.
Wisconsin,	Edward Kremers,	Madison.
	John R. Drake, 365 East Water street,	Milwaukee.
Prov. Nova Scotia,	Francis C. Simson, Pentagon Bldg.,	Halifax.
Prov. Ontario,	John A. Clark, E. King street,	Hamilton.
Prov. Quebec,	Henry R. Gray, 122 St. Lawrence Main street,	Montreal.

THE PERMANENT FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are three permanent Funds at the present time, all of which are invested in Government bonds, in the name of the Treasurer of the American Pharmaceutical Association, and kept in the custody of the Chairman of the Council.

THE LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named, a revised Constitution was reported by a committee, and, after consideration adopted (see Proceedings 1856, pp. 12, 14, 27 and 79). Article II., Section 7 (afterwards Section 8), contained the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members, and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings. p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings 1870, pp. 87–96), and this, with a few slight amendments adopted in 1896 and 1900, is in force at the present time, containing the following:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, *the interest of which for any current year only may be used by the Association for its expenses.*"

Chapter VI., Article 5, of the By-Laws adopted the same year, reads as follows:

"Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and again in 1896 and changed to Article IV., Chapter VIII. As now in force, it reads as follows:

"Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, or after twenty-five years $30, or after thirty years $20, or after thirty-five years $10, also any member who shall have paid to the Treasurer annual dues for thirty-seven years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (page 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one

(until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings 1879, page 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, page 52) and again in 1896 (Proceedings, page 17) so as to apply also to those who have been members for over twenty years (see Chapter VII., Article 4 of By-Laws). Under this clause the life membership (new style) of the present roll is sixty-four, as published in the Proceedings.

The Treasurer's report for 1880 (page 524) states the life membership fund to be $75, for 1881 (p. 513) $613, for 1882 (p. 608) $685, for 1883 (p. 436) $904.38, and for 1884 (p. 524) $944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that $316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund and be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147), it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of $3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471), the Association ordered again a transfer to the same Fund of $4,000.

Since 1887 the annual reports of the Chairman of the Council give the number of each bond of the Government securities in which the Life Membership Fund is invested. The report published on page 74 of the present volume shows that on April 15th, 1900, the value of the Life Membership Fund was $12,137.44 (face value of securities only given), of which sum *the interest for any current year only may be used by the Association for its expenses.*

THE EBERT FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars, to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated *for conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determined merit, for the preparation of chemical or pharmacal products: the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; *provided*, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, page 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize.*

The Ebert Prize was awarded for the year 1874 to Chas. L. Mitchell; for 1877, to Fred. B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897 to Albert B. Prescott and Jas. W. T. Knox; for 1898 to Virgil Coblentz; for 1899 to Henry Kraemer; and for 1900 to Edward Kremers and Oswald Schreiner.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to $683.43. Since 1887 the reports of the Chairman of the Council specify the securities in which this fund is invested. On April 15th, 1900 (Proceedings, p. 74), its reported value was $762.04 (face value of securities only given). The *annual interest must be applied to a prize for an original investigation* meeting the requirements stated above.

THE CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left, which by subsequent collections made in Philadelphia was increased to $525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees, to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund *to aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526, 528), and adopted the name *Centennial Fund.*

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings 1880, p. 553), when $582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII. (Proceedings 1881, pp. 190, 549). Members have not availed themselves of this Fund to the extent contemplated at its foundation; for the amounts paid out have been only $7.50 to Robt. B. Warder for material used for investigations reported in 1885; $96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings 1889, page 16); and $32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892, $50 to the same investigator in 1893, and $50 again to the same investigator in 1894. In 1896 the sum of $22.33 was paid to the Committee on Indicators for material used in their investigations.

The original sum of $1107.81 ($525+$582.81) had increased in 1883 to $1232.76. Since 1887 the securities in which the Fund is invested are specified in the reports of the Chairman of the Council; the reported value was $1556.95 (face value of securities only given) on April 15, 1900 (see Proceedings, p. 74). *The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science.*

THE GENERAL FUND.

In October, 1891 (see Proceedings 1892, page 13), the Council instructed the Treasurer to draw from the cash on deposit a sufficient sum and purchase therewith three bonds, one thousand dollars each, the same to be such bonds as shall be approved by the Finance Committee, said bonds to be registered in the name of the Treasurer of the American Pharmaceutical Association, and placed in the custody of the Chairman of the Council.

The investment was made in bonds of the American Security and Trust Company at Washington, D. C., for the sum of $3021.62 (see Proceedings 1892, pages 27 and 28). On July 1, 1897, the above bonds were redeemed, and six (6) 4 per cent. bonds of the same company, each for $500.00, taken at par and accrued interest.

At the Richmond meeting in 1900, the Chairman of the Council and the Treasurer were instructed to sell the bonds belonging to the General Fund and to place $1000.00 of the proceeds into the treasury and the balance in the Life-Membership Fund (see Proceedings, 1900, p. 18).

PRIZES.

The resolutions adopted August 15, 1893 (see page 16, Proc. 1893) were amended September 1, 1898 (see page 98, Proc. 1898) to read as follows:

Resolved, That if worthy papers be presented, the Association award annually three prizes for the three most valuable papers, aggregating the sum of $100.00, and apportioned as follows: $50.00 for the first, $30.00 for the second, and $20.00 for the third prize.

Resolved, That a Committee of three be annually appointed by the President of the Association, their duty to be, first, to decide if one or more of the papers presented are worthy of a prize, and second, to decide upon the relative merits of such papers as are deemed worthy.

Resolved, That nothing in these resolutions shall be so construed at any time as to prevent the writer of the Ebert Prize paper from also receiving one of the Association Prizes for said paper

The following resolutions were adopted September 1, 1898 (see page 98, Proc. 1898).

Resolved, That a prize be established to be known as the "Hermann Hager Memorial Prize," and of the value of $50.00. That in bestowing said prize, preference shall be given to contributions on pharmaceutical science or art, as distinguished from those on allied branches, though it shall not be confined to such. That said prize shall be awarded only when, in the opinion of the Committee on General Prizes, a contribution shall be deemed worthy of the award.

Resolved, That a prize be established to be known as the "John M. Maisch Prize," of the value of $50.00. Said prize to be awarded for research work in pharmacognosy, only on the recommendation of the Committee on General Prizes.

Resolved, That no one of the general Association prizes shall be awarded to the writer of a paper for which either the Hermann Hager Prize or the John M. Maisch Prize has been given.

For names of members of this Committee see page v.

CONTENTS.

PAGE

Officers of the Association iii
Council: Members, Officers and Committees iv
Standing Committees of the Association v
Special Committees of the Association vi
List of Officers of the Association since its Organization x
List of Officers (past and present) of the Council xv
List of Officers (past and present) of the Sections xvi
Authorized Agents of the Association xvii
Permanent Funds xx
Prefatory Notice xxxi

MINUTES OF THE FORTY-EIGHTH ANNUAL MEETING.

Minutes of the First Session 1
Address of Welcome by the Governor of Virginia, Hon. J. Hoge Tyler 1
Address of Welcome by the Mayor of Richmond, Hon. R. M. Taylor 3
Reply to Address of Welcome: Wm. C. Alpers 3
Reply to Address of Welcome: Henry P. Hynson 4
Message from Dr. Fred'k Hoffmann 5
Annual Address of President Prescott 5
Report of Committee on Credentials 11
Reading of Proposed Amendments to the Constitution 11
Adoption of Amendments to the Constitution 12
Reading of Reports of Committees by Title 12
Minutes of the Fourth Session of the Council 13
Motion to Use a Heavier Binding for the Proceedings 13
Motion to Hold the Forty-Eighth Annual Meeting at Richmond, Va., from May 7th to 12th 13
Motion to Appropriate $100.00 for Use of the Committee on Membership 13
Motion to Transfer the Several Funds of the Association from the Savings Bank at Dover, N. H., to the Fidelity Insurance, Trust and Safe Deposit Company of Philadelphia, Pa. 14
Motion to Authorize Printing of 10,000 Copies of the Physicians' Epitome of the National Formulary 14
Motion to Authorize the Treasurer to Make a Loan of $1000.00 4
Motion to Allow Henry C. Porter to Withdraw His Resignation 15
Motion to have Forty Gold Bars Made 15
Motion to Adopt Programme of the Forty-Eighth Annual Meeting 5
Appointment of Committee on Credentials 16
Reading of Names of Applicants for Membership 16
Report of Committee on Publication 16
Vote of Thanks to the Chairman of the Committee on Membership 17
Report of Auditing Committee 17
Motion to Add $1400.00 to Appropriation for Salaries for the Present Fiscal Year 18
Motion to Direct the Treasurer to Send to the General Secretary a Statement of Receipts and Expenditures from April 1, 1900, to June 30, 1900; also, the Usual List of Payments and a Summary of Disbursements for the Fiscal Year 1899 to 1900 18
Motion to Drop the Names of Life Members from the List when their Residence has been Unknown for Five Consecutive Years 18
Motion to Add Another Rule, the Fourteenth, to the General Rules of Finance 18
Motion to Authorize the Payment of the Promissory Demand Note Now Outstanding 18
Motion to Extend the Date of Issue of the 1900 Proceedings to November 15, 1900 18
Motion in Regard to Remuneration for Work in Preparing the Epitome of the National Formulary 18
Motion to Hold Daily Meetings at 9:30 a. m. 18
Selection of Nominating Committee 19

PAGE

Appointment of Committee on Time and Place of Next Meeting 20
Appointment of Committe on President's Address 20

Minutes of the Second Session 20
Report of Nominating Committee 20
Election of Officers for the Ensuing Year 21
Reading of Memorial of Wm. Procter, Jr 22
Vote of Thanks to the Author, J. P. Remington 30
Address of Jno. B. Purcell on Pehalf of the N. W. D. A 31
Remarks of F. E. Holliday 31
Minutes of the Fifth Session of the Council 32
Reading of Names of 22 Applicants for Membership 32
Motion to Allow Chas. W. Hancock to Withdraw his Resignation 32
Motion to Adjourn at 12 o'clock noon for a Recess only to 3 o'clock P. M 32
Reference of Report of Committee on Revision of U. S. Pharmacopœia to the Scientific Section 32
Reference of Report of Committee on National Legislation to the Section on Education and Legislation 33
Report of Committee on National Formulary 33
Report of Special Committee on Weights and Measures 34
Report of Auxiliary Committee on Membership 35
Report of Committee on Membership 36
Report of Committee on European Tour 46
Report of the Treasurer 47
Report of Financial Accounts in the care of the General Secretary 52
Letter from Dr. E. R. Squibb 53
Report of Delegates to the N. A. R. D 54
Reference of Report of Delegates to the National Pure Food and Drug Congress to the Section on Education and Legislation 55
Motion to Appoint a Committee on Future Welfare of the Association 58

Minutes of the Third Session 58
Minutes of the Fourth Session 58
Minutes of the Fifth Session 58
Minutes of the Sixth Session 58
Minutes of the Seventh Session 58
Minutes of the First Session of the New Council 58
Election of Officers of the New Council 58
Nomination and Election of Committees 59
Election of H. M. Whelpley as Local Secretary for 1901 59
Resignation of H. M. Whelpley as Member of the Council 59
Nomination of A. B. Prescott to Fill Vacancy in Council 60
Motion to Remit Dues of Frank Harrington and make him a Life-Member, Old Style 60
Motion to Authorize C. Lewis Diehl to Select an Auxiliary Committee to Assist in Revising the National Formulary 60
Motion to have Reprints made of the Memorial of Wm. Procter, Jr 60
Motion to Amend the Eighth Rule of Finance 60
Motion to Appoint a Committee to Confer with the N. A. R. D. in Regard to Simultaneous Meetings of the Two Associations 60
Minutes of the Second Session of the New Council 60
Reading of Names of 4 Applicants for Membership 60
Nomination of J. M. Good to fill Vacancy in Council 60
Motion to Refer all Communications Received by the Committee on Practical Pharmacy and Dispensing to the Committee on Publication 60
Motion to Recommend the Establishment of a Section on Practical Pharmacy and Dispensing, and to appoint a Committee to Suggest Proper Amendments to the By-Laws to Effect this Object 60
Election of A. B. Prescott and Jas. M. Good as Members of the Council 61

Minutes of the Eighth Session 61
Minutes of the Ninth Session 61
Minutes of the Tenth Session 61
Minutes of the Third Session of the New Council 61
Reading of Names of 3 Applicants for Membership 61
Communication from the Section on Education and Legislation 62

PAGE

Motion to Refer the Communication to the Committee on Programme 62
Motion to Amend Article XI. of Chapter VIII. of the By-Laws 62
Motion to have 100 Copies of the Report on the Progress of Pharmacy Bound in Paper for the Use of the Committee on Membership..... 62
Motion to Appropriate $100.00 for the Use of the Committee on Membership..... 62
Motion to Amend Article II. of Chapter VI. of the By-Laws; also Article II. of Chapter VIII., Article VI. of Chapter VIII., Article VIII. of Chapter VIII., and Article I. of Chapter IX..... 62
Motion to Appropriate $50.00 to Defray the Expenses of the Special Committee on the Proposed Pharmacy Law..... 62
Motion to Recommend Simultaneous Meetings of the Sections on Commercial Interests and Scientific Papers..... 63

Minutes of the Eleventh Session 64
Election of Officers of the Section on Practical Pharmacy and Dispensing..... 64
Nomination and Election of Wm. C. Alpers to Fill Vacancy in the Council 64
Report of Committee on General Prizes 64
Report of Committee on President's Address..... 65
Report of Committee on Future Welfare of the Association 65
Report of Committee on Transportation 68
Report of Delegates to the Pharmacopœial Convention..... 69
Report of Committee on the Status of Pharmacists in Government Employ..... 70
Report of Chairman of Council on the Funds of the Association 74
Resolution Endorsing the Work and Plans of the N. A. R. D..... 75
Resolution in Favor of Repealing Schedule B of the War Revenue Bill 75
Point of Order as to Consideration of a Proposed Amendment to the Brosius Pure Food and Drug Bill..... 76
Paper Read by S. W. Williams. Motion to Publish in Full..... 77
Motion to make the Local Secretary for 1901 Chairman of the Committee of Arrangements for Next Annual Meeting 77
Motion to Authorize and Instruct T. A. Miller to have Charge of and Preside at the Twelfth or Social Session..... 77
Installation of New Officers..... 78
Resolutions of Thanks to the Local Secretary, the Committee of Arrangements and Mrs. T. W. Jeffress..... 80
Reply of T. Roberts Baker..... 82

Minutes of the Twelfth Session..... 83

MINUTES OF THE SECTION ON COMMERCIAL INTERESTS.

Minutes of the First Session..... 84
Address of the Chairman, Jas. M. Good 84
Address of F. E. Holliday on Behalf of the N. A. R. D..... 88
Resolution to Endorse the Work of the N. A. R. D..... 91
Methods of Advertising. By F. W. E. Stedem..... 91

Minutes of the Second Session 93
A Scheme to Popularize the U. S. Pharmacopœia as the only Means to Combat Quackery in Medicine 94
The Commercial Value of a Pharmaceutical Education. By Joseph Jacobs..... 96
Resolutions to Ask for Repeal of Schedule B of the War Revenue Bill..... 98
Address of F. G. Ryan on a Commercial Course in a College of Pharmacy 99
Report of Committee on Practical Pharmacy and Dispensing..... 103
Nomination and Election of Officers for the Ensuing Year..... 114
Installation of New Officers..... 116

MINUTES OF THE SECTION ON SCIENTIFIC PAPERS.

Minutes of the First Session..... 118
Address of the Chairman, by F. G. Ryan 118
Report of Committee on the Ebert Prize..... 121
Appointment of Committee on Chairman's Address..... 122
Nomination of Officers for Ensuing Year 122
Application of the Modified Alkalimetric Method to the Assay of Drugs and Chemicals. By H. M. Gordin 122
Short Directions for the Assay of Opium. By H. M. Gordin and A. B. Prescott 127

PAGE
The Alkaloids of Bocconia Cordata. By Paul Murrill and J. O. Schlotterbeck ... 128
Extraction and Estimation of Colchicine. By H. M. Gordin and A. B. Prescott ... 133
On the Alkaloids of Ceanothus Americanus. By H. M. Gordin ... 138
Suggestions on the Introduction of Powdered Vegetable Drugs in the U. S. Pharmacopœia. By Albert Schneider ... 141
Color Standards of the Vegetable Drugs of the U. S. Pharmacopœia. By Henry Kraemer and Herbert J. Watson ... 146
Notes on Jalap Roots Examined During the Past Six Years. By Lyman F. Kebler ... 163
The Pharmacologic Assay of Drugs. By E. M. Houghton ... 165
Physiological vs. Chemical and Microscopical Examination of Drugs. By Lyman E. Kebler ... 169
Assay of Drugs by the Use of Living Plants. By Henry Kraemer ... 171
Minutes of the Second Session ... 183
Election of Officers for the Ensuing Year ... 183
Report of Committee of Research ... 184
Pharmaceutical Bacteriology. By Albert Schneider ... 186
The Examination of Urine, Blood, Sputa and Like Substances by the Practical Pharmacist. By F. W. E. Stedem ... 191
Urinalysis by the Pharmacist. By G. W. Parisen ... 197
Answers to Queries Issued by the Scientific Section of the Amer. Pharm. Assoc. By. E. L. Patch ... 199
Wild Cherry Bark and Its Preparations. By A. B. Stevens ... 207
Atropa Belladonna or Scopola Carniolica. By A. R. L. Dohme and H. Engelhardt ... 211
Minutes of the Third Session ... 214
A So called Ipecac. By Henry Kraemer ... 214
Proximate Analysis of Eupatorium Perfoliatum. By Charles A. Walter ... 216
What Representative Pharmacists and Physicians Think About Plasters. By S. W. Williams. 232
Some of the Reasons why Compound Spirit of Ether and Ethereal Oil do not Merit Space in the U. S. Pharmacopœia. By Geo. W. Boyd ... 254
The Nature of Commercial Sanguinarine Nitrate. By J. O. Schlotterbeck ... 256
Report of Committee on Chairman's Address ... 260
Report of the Committee on the Revision of the U. S. Pharmacopœia ... 261
On Alcohol as an Antidote for Carbolic Acid Poisoning. By E. V. Howell ... 261
The Cerate of the Extract of Cantharides. By Geo. E. Barksdale ... 263
New Formula for Aromatic Spirit of Ammonia. By Wm. C. Alpers ... 266
Adlumia Cirrhosa, a New Protopine-bearing Plant. By J. O. Schlotterbeck ... 267
On the Pharmacopœial Recognition of Diphtheria Antitoxin. By Jos. W. England ... 271
Election of Members of the Committee of Research ... 275
Intallation of New Officers ... 276
Vote of Thanks to the Retiring Officers ... 276

MINUTES OF THE SECTION ON EDUCATION AND LEGISLATION.

Minutes of the First Session ... 277
Address of the Chairman, C. B. Lowe ... 77
Report of the Secretary ... 280
Motion to send Copies of the Report to Officers of the Boards of Pharmacy ... 284
Report of Committee to Draft a Model Pharmacy Law ... 284
Appointment of Committee to Prepare a Revised Form of the Model Pharmacy Law and to Incorporate therein the Amendments Adopted ... 290
Motion to Request Council to Prevent in the Future any Interference with the Work of the Sections by the Entertainment Features ... 290
Nomination of Officers for the Ensuing Year ... 291
Appointment of Committee on Chairman's Address ... 291
Minutes of the Second Session ... 291
Election of Officers for the Ensuing Year ... 291
Reading of the Draft of a Model Pharmacy Law ... 292
Minutes of the Third Session ... 292
Report of Committee on National Legislation ... 292
Report of Delegates to the National Pure Food and Drug Congress ... 295
Amendment Offered to the Pure Food and Drug Bill by the Richmond Chamber of Commerce 302
Report of Committee to Prepare Revised Form of the Model Pharmacy Law ... 305
A General Form of Pharmacy Law Suitable for Enactment by the Several States of the United States. By Jas. H. Beal ... 309

PAGE
Appointment of Committee to Place the Model Pharmacy Law before the State Boards of Pharmacy and the State Associations 318
Vote of Thanks to Jas. H. Beal 318
Report of Committee on Chairman's Address 319
A Plea for a National Library and Museum of the History of Chemistry and Cognate Arts and Sciences. By Fred. Hoffmann 320
Resolutions from the Pharmacopœial Convention held at Washington, D. C., May, 1900 323
Report on Preliminary Education for Students of Pharmacy 323
The Status of the Drug Trade in Maine under the Prohibitory Laws of the State. By Chas. K. Partridge 330
Fluid Extract Labels. By E. G. Eberle 333
Erroneous Prescriptions. By Louis Schulze 340
Under what Restrictions should Pharmacists be Permitted to Sell Liquors? ByG. G. C. Simms. 341
Selection of Associate Members of the Committee on Education and Legislation 342
Entertainments at the Forty-Eighth Annual Meeting 343

ANNUAL REPORT ON THE PROGRESS OF PHARMACY.

Introductory 345
Proceedings of the State Pharmaceutical Associations 377
Pharmacy 386
General Subjects 386
Apparatus and Manipulations 386
Preparations 423
New Remedies 543
Materia Medica 559
Vegetable Drugs 559
Animal Drugs 667
Inorganic Chemistry 671
Organic Chemistry 729

APPENDIX.

Treasurer's Supplementary Report of Receipts and Expenditures from April 1, 1900, to June 30, 1900, inc. 862
Supplementary Report of the Financial Accounts in care of the General Secretary, from April 1, 1900, to June 30, 1900, inc. 864
List of Members from whom Money has been Received by the Treasurer for Annual Dues or Certificates from July 1, 1899, to July 1, 1900 866
List of Colleges and Associations having Accredited Delegates at the Forty-Eigth Annual Meeting .. 873
List of Members and Delegates in Attendance at Richmond, Va. 875
List of New Members 877
List of Life Members 879
General Incorporation Law for the District of Columbia 881
Certificate of Incorporation 882
Constitution and By-Laws of the Association 884
By-Laws of the Council 894
Order of Business at the Meetings of the Sections 897
General Rules of Finance 899
Forms of Application and Proposition for Membership 901
Roll of Members 902
List of Members Residing in Foreign Countries 923
List of Members whose Residence is Unknown 923
Alphabetical List of Members 924
List of Resignations 949
List of Members who have Died Since the Issue of Last Proceedings 949
List of Members Dropped from the Roll for Non-payment of Dues 950
Index 953

PREFATORY NOTICE.

At the forty-second annual meeting of the Association held at Asheville, N. C., the Council determined that the distribution of the printed Minutes, together with the papers read at the meeting, in advance of the bound volume of the Proceedings, which plan had been in operation since 1891, should be discontinued. This action of Council was approved by the Association at large at the General Session held September 8, 1894.

With the view of securing for the Proceedings as wide a distribution as possible, and to enable members to complete their sets at very low figures, the Council, at the forty-third annual meeting held at Denver, Colo., decided that the price of the Proceedings for 1890 and all previous years be reduced to one-half of that heretofore published. The Association at the General Session held on August 20, 1895, approved the action of Council, and the Committee on Publication offer the different issues at the following rates:

		PAPER COVER.	BOUND CLOTH.
1851, 1852, 1853, 1854, 1855	each	$ .13	$
1857	"	.20	.25
1858, 1864, 1865	"	.38	
1858, 1860, 1862, 1863, 1864, 1865	"		.50
1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873	"	.50	.75
1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883	"	1.25	1.50
1884, 1885, 1886, 1887	"	1.75	2.00
1888, 1889, 1890	"	2.50	2.75
1891, 1892, 1893	"	5.00	5.50
1894	"	6.00	6.50
1895	"	5.50	6.00
1896, 1897, 1898, 1899	"	5.00	5.50
1900	"	5.00	5.50

The reduced prices on all volumes published prior to 1891 do not include free delivery.

IN SETS (EXCLUSIVE OF THE POSTAGE OR EXPRESS CHARGES).

For any two or three volumes a discount of 10 per cent. on the above prices.

For any four to eight volumes a discount of 20 per cent. on the above prices.

For any nine to fifteen volumes a discount of 30 per cent. on the above prices.

For any sixteen to twenty-two volumes a discount of 40 per cent. on the above prices.

For any twenty-three to thirty-two volumes a discount of 50 per cent. on the above prices.

For any more than thirty-two volumes a discount of 60 per cent. on the above prices.

1856 and 1859 are out of print; none published in 1861.

Beginning with the first issue, in 1851, the actual cost of partial or complete sets—bound in cloth as far as on hand—will be as follows:

To and Including	Number of Vols.	Price by Single Vols.	Price the Set Net.	To and Including	Number of Vols.	Price by Single Vols.	Price the Set Net.	To and Including	Number of Vols.	Price by Single Vols.	Price the Set Net.
1855	5	$0 65	$0 52	1873	20	$9 90	$5 94	1888	35	$35 65	$14 26
1857	6	0 90	0 72	1874	21	11 40	6 84	1889	36	38 40	15 36
1858	7	1 40	1 12	1875	22	12 90	7 74	1890	37	41 15	16 46
1860	8	1 90	1 52	1876	23	14 40	7 20	1891	38	46 65	18 66
1862	9	2 40	1 68	1877	24	15 90	7 95	1892	39	52 15	20 86
1863	10	2 90	2 03	1878	25	17 40	8 70	1893	40	57 65	23 06
1864	11	3 40	2 38	1879	26	18 90	9 45	1894	41	64 15	25 66
1865	12	3 90	2 63	1880	27	20 40	10 20	1895	42	70 15	28 06
1866	13	4 65	3 26	1881	28	21 90	10 95	1896	43	75 65	30 26
1867	14	5 40	3 78	1882	29	23 40	11 70	1897	44	81 15	32 46
1868	15	6 15	4 31	1883	30	24 90	12 45	1898	45	86 65	34 66
1869	16	6 90	4 14	1884	31	26 90	13 45	1899	46	92 15	36 86
1870	17	7 65	4 59	1885	32	28 90	14 45	1900	47	97 65	39 06
1871	18	8 40	5 04	1886	33	30 90	12 36				
1872	19	9 15	5 49	1887	34	32 90	13 16				

Orders for Proceedings should be sent to the General Secretary, 109 Aisquith street, Baltimore, Md.

The gold badge of the Association may be procured from the General Secretary on receipt of $2.

Blank forms of application and recommendations for membership may be obtained from the General Secretary or from the Committee on Membership; when properly filled up they should be sent to the Secretary of the Committee on Membership, Geo. W. Kennedy, Pottsville, Pa., at least one week before the meeting; if sent later, they should be addressed to him in the care of the Local Secretary, H. M. Whelpley, 222 S. Broadway, St. Louis, Mo.

The forty-ninth annual meeting of the Association will convene at Saint Louis, Mo., on the third Monday (16th day) of September, 1901, at 3 o'clock, p. m.

MINUTES

OF THE

FORTY-EIGHTH ANNUAL MEETING.

The forty-eighth annual meeting of the American Pharmaceutical Association was held in the city of Richmond, Virginia, May 7–12, 1900, with headquarters at the Hotel Jefferson, where the various sessions were held. The weather was delightful throughout the meeting, and the historic capital city of the "Old Dominion" was indeed fair to look upon in her fresh attire of vernal leaves and flowers.

First Session—Monday Afternoon, May 7, 1900.

The first general session was called to order at 3 : 25 p. m., in the convention hall of the hotel, built on the roof. President A. B. Prescott, of Ann Arbor, Mich., called the Association to order, and said :

Members of the American Pharmaceutical Association, ladies and gentlemen, the forty-eighth annual meeting of the Association is now in session. As we convene here in the Commonwealth of Virginia and city of Richmond, the Honorable Governor Tyler, of Virginia, will speak to us some words of welcome.

Governor Tyler arose amid the applause of the convention, and spoke as follows :

Mr. President, Ladies and Gentlemen :

I am not much at making excuses, and I really am not going to make an excuse on this occasion, but I feel that an explanation, at least—a brief explanation—is due on account of what may follow. My friend Mr. Miller did me the honor to ask me to make an address of welcome to this Association, and I directed that the date and the occasion be booked, but by somebody's oversight it was not done, and the time passed until this morning before I realized that the day was upon me. I insisted that they secure the services of some more ready speaker—some one of those who have speeches of this kind always prepared and on hand [laughter], but neither my friend Dr. Baker, nor Mr. Miller, would consent to letting me off. They are as persistent as some of your remedies—they stick !

I suppose there are but few men in Virginia that know as little about drugs as I do.

My first lesson—which was my graduation exercise, also—was contained in an experience I had with an old darkey on my farm about twenty years ago. I had a horse that we were all fond of—devoted to; but it was taken down sick, and some of the horse doctors pronounced it consumption. At any rate, the poor old horse died a lingering death. After having lain out in the field for a long time, receiving meanwhile the most careful treatment we could give it, we left it for good as dead. The next morning, as I was going away to a distant part of the farm, I said to this old negro, "You go over there in the field, and if that horse is not dead just take an axe and knock him in the head and drag him off." When I got home, I heard he had been taken away, and I asked the old man if the horse was dead when he got to him. "O-oh, no, sir," he said. "Did you knock him in the head?" I asked him. "N-n-no, sir; I didn't knock him in the head." "Why didn't you," I said. "H-he-he jes' look up out er his eye so pitiful like dat I jes' cudn't fin' it in my h'art ter do it." "What *did* you do, then?" I asked. "I-I jes' tuk an' put a chain aroun' his naik and jes' *drug* him ter deth!"

Now, my friends, that is all I know about drugs. And it is almost all I know about speech-making.

A few weeks ago, I was called on in this city, at the "Commonwealth Club," almost as unexpectedly as I have been on this occasion, to deliver an impromptu talk, and how well I succeeded in performing that duty can be surmised from the following incident: On the next Sunday morning, as I was going to Sunday-school [laughter], I overheard some talk between three gentlemen who were just ahead of me. One of them remarked to the others, "They tell me if you want the best after-dinner speech you ever heard in your life, you just get Governor Tyler about two-thirds drunk, and he will give it to you!" Now, my friends here have not taken that precaution. I said to them, "It is about the eleventh hour now, and I suppose it will be too late to expect from you such a preparation as that."

I don't know what sort of compounds you druggists make on occasions of this kind. I hope it is not quite as bad as the liquor they sell in my town. Sam Jones was making a temperance talk there some weeks ago, and he said the whisky they sold in that town was so strong that three thimblefuls of it would make an old hare so impudent she would stand up before a bulldog and spit in his face. Now, if I had some such preparation as that to-day, I might be able to better discharge the pleasant duties that have been assigned me.

American Pharmaceutical Association—I believe that is your name. Put the three together, and I get so tangled up I can hardly say it, and I don't know what it means. I know what "farm" means, though you don't spell it right. You have all heard about the school-teacher who lost his job because he persisted in spelling "taters" with a "p" in a district where that style was not popular. Now, you fellows insist on spelling "farm" with a "ph." We spell it here in the plain old English way—"f-a-r-m." I know what "farm" is, but "phar-ma—pharma-*cu*tical—gets me. The "*cu*tical" part, I suppose, is the *skin* of pharmacy.

My friends, I am sure that Virginia welcomes you on this occasion. Many years ago, there was an effort made by some of our Northern friends to visit us, and we celebrated their coming with smoke and ball. Now we celebrate your coming with the sweet songbird of spring and the opening flower. We rejoice to have you with us. You have all heard of the hospitality of Virginia, the fame of which has reached beyond our borders, and I want to say to you that her doors are thrown open to her guests. She is ready to receive you to her heart and her homes, and we are glad to have you come among us on this occasion. [Applause.]

The City of Richmond—to which you will be welcomed by her distinguished Mayor presently—is about to put on her gala attire, and we will have gathered together from every section of this grand old Commonwealth the truest and noblest of her sons, and

the loveliest and fairest of her daughters, and we hope you may be persuaded to remain with us until you have enjoyed that occasion.

We welcome you, Mr. President, and your Association. We welcome you, thrice welcome you, to the State, and my distinguished friend, the Honorable Mayor of Richmond, will give you a hearty and cordial welcome to this beautiful city. [Great applause.]

THE PRESIDENT: We find that we have already entered upon the well-known hospitality of Virginia. Now his Honor, Mayor Taylor, desires to extent a further welcome on behalf of this fair city. Gentlemen, I present to you Mayor Taylor, of Richmond.

The Mayor was greeted with applause, and spoke as follows:

Mr. President, and Ladies and Gentlemen of the American Pharmaceutical Association:

My province as Mayor is to welcome you to the City of Richmond. The pleasure afforded me by your presence is such as to justify me in throwing open the city to you. My fellow-citizens will readily agree that I should try to show our appreciation of your coming by doing all in my power to make your stay pleasant, and you will find our hospitable homes thrown open to you.

You will not expect me to enter into the science of your profession, for the discussion of your themes properly belongs to trained minds, and I content myself with simply bidding you a hearty welcome to the city. [Great applause.]

THE PRESIDENT: On the part of the Association, I will request Mr. Alpers, of New Jersey, to make some reply to these hearty words of welcome from the Governor and the Mayor.

Mr. Alpers was applauded as he arose to speak, and said:

Governor Tyler and Mayor Taylor: It is with some embarrassment that I rise to reply to the kind words of welcome that you have just addressed to us, and tender you the hearty thanks of the American Pharmaceutical Association.

We all know that the soil on which we stand is sacred ground to every American. In historic reminiscences and in relics that recall the great deeds of the founders of this Republic, there is probably no State that is superior to Virginia. It was my privilege to arrive here a few days before the larger number of my friends, and I took advantage of the time I had yesterday to stroll through your hospitable city. I stopped near the state house, and looked in admiration upon the splendid statue of the greatest son of your State—and of all the States—surrounded by a group of illustrious men of Virginia, each of whom has done deeds great enough to make his name immortal in the history of your State and of the United States, and of the world. I then went to the other end of the city and strolled through the Hollywood Cemetery and stood in silent contemplation at the graves of two of our great Presidents—Monroe and Tyler. It was my privilege later to be conducted through the city by one of your oldest citizens, Col. Baker; and at every turn he showed me some point of interest connected with the Revolutionary war or the late war. At night, it was my privilege to worship in the church where the greatest statesmen of Virginia have worshipped before me. I yielded to the inspiration that came upon me at every step in going about this beautiful and historic city, and I feel proud to-day that I can bring the greetings of my own State—the State in which the battles of Princeton and Trenton were fought—to the representatives of this great Commonwealth, the greatest of all, perhaps, in history, and which harbors within its bounds the shrines of Mt. Vernon and Monticello.

You may say that these thoughts are rather sentimental, and have no place in a gathering of a society of men that convene for scientific research, commercial advantage and,

incidentally, for social intercourse; but I claim that when men leave their homes for a change from the daily toil of business, and come together once a year to meet their old friends and shake hands again, it is not out of place to cast a glance backward, and dwell for a moment upon the glorious legacy of liberty left us by the founders of this great Republic—a legacy, however, that does not only consist in the enjoyment of our liberty and of our liberal institutions, but which is given to us conditionally, and that condition is good citizenship on our part. It may be ever so honorable to be a great scientist, it may be ever so gratifying to be a successful business man, it may be ever so enjoyable to be a good painter or fine musician, but it is better still to say of a man that he is a good citizen; and here at this place and this hour we may appropriately recall this legacy that the grand statesmen of the past have left us, and give way to the inspiration that leads to the resolve to fulfill and continue their work.

Mr. Governor and Mr. Mayor, this welcome that you have honored us with will, I know, have its influence upon our Association. I know there is a sympathetic chord in the hearts of all of us, and I feel that if, at the end of the week, we shall consider that we have worked to the success of our meeting, it will in no small sense be due to the welcome of Governor Tyler and Mayor Taylor. [Great applause.]

THE PRESIDENT: We should be very glad if each one of us could reply to the warm welcome of the Governor and the Mayor, and even then we should hardly be able to express our gratitude for, and appreciation of the welcome that has been extended to us; but as this cannot be done, I will ask at least one other member of the Association—Mr. Hynson, of Baltimore—to come forward and say a few words in response to this welcome.

Mr. Hynson was heartily applauded as he came forward to speak. He said:

Mr. President, Ladies and Gentlemen: I once tried to make a funny speech upon the recommendation of my friend, Mr. Caspari, who is noted for his wit and humor. (?) Some little success attained then has forever destroyed my usefulness as a speaker. My experience is something like that of Congressman John Allen, of Mississippi, and nothing that I may now say is ever taken seriously. Indeed, I feel very much like that old "Johnny Reb" who dragged himself, on a long march, through the mud of Orange county, or some other county equally as muddy, and, after marching along for days—possibly following Jackson—finished yet another day's march and came at last to the place where he was to rest for the night. Marching up to an old rail fence, heavy-laden, footsore and tired as he was, he threw his old musket over the fence and said: "If ever I love another country, d—n me!" [Great laughter.] If I ever make another funny story, d— you will know it.

As a native of the Eastern Shore of Maryland I ought not to have been afraid to enter Richmond from the front, but I was afraid I might be taken for one of you Northern or Western fellows, and, being a little fearful lest they had not yet heard the war was over down here, I came in from the rear, via Newport News. I remember hearing something in my boyhood days about the long distance to Richmond and how hard it was to ge there, but I never knew fully what it meant until a long time after. When the Army of the Potomac met in Baltimore some years ago, some one said they had been invited to other places, among them Richmond. Gen. Horace Porter got up and said, "The Grand Army of the Potomac never undertakes to go to Richmond, unless it has four years in which to get there." But times have changed now, and the Governor has said we are welcome to the State, and I heard the Mayor say the city was wide open. Some of these gentlemen will be glad to hear that, I know. As a citizen of Maryland, I know

what that welcome means. I know it is something akin to ours, but it is, perhaps, greater, because I believe the further you go South the warmer the welcome, especially to the Northerner.

We know we are welcome here, gentlemen, and while we thank the Governor and the Mayor for the kind words they have spoken, we will show them we are welcome by making the city our own, and as such we will consider it for the next few days. [Applause.]

THE PRESIDENT: At this juncture, I will ask a member of the Association who is well known to you to take the chair while the President's address is being read. He is a citizen of a State which has furnished several Presidents to the Association, and if it had not been for his exceeding modesty I doubt not it would have fallen upon him to call this meeting to order this afternoon. The Vice-President, Mr. Lewis C. Hopp, will please take the chair.

Mr. Hopp was applauded as he took the chair.

THE CHAIRMAN: Before the President's address is presented, I would like to read to the Association a word of greeting from Berlin, from our old friends, Dr. and Mrs. Frederick Hoffmann:

"Kind regards to those good friends assembled at Richmond who still remember us. We attended the pleasant meeting in Richmond in September, 1873, and affectionately remember the many dear friends met there, both the living and the departed ones.

FREDERICK HOFFMANN—MARIE HOFFMANN."

The President then read his address as follows:

Fellow Members, Ladies and Gentlemen:

In coming together for the forty-eighth annual meeting, we join in heartiest greetings of renewed fellowship with each other, and in sincerest gratitude to Almighty God for the prosperity of our country and of our profession. The year of our Lord nineteen hundred marks an era of advancement in commercial and scientific opportunity. It belongs to us as a company of active workers to keep step, well forward, in the march of events. Therefore it seems proper, so far as the brief limits of this address permit, to look over the situation of pharmacy at the present and take account of the work immediately before us.

I know that if I were to greet some of my friends with the question, What is it now about pharmacy, that makes it very different from other pursuits? some one would answer me, it is only this, that it is a losing business. Now I cannot accept this answer to the question as stated. If on the word of its practitioners this pursuit is a losing business at certain periods, that does *not* distinguish pharmacy from other indispensable pursuits, such as carrying on a farm, running a railroad, or following the practice of medicine.

DEPARTMENTS OF PRACTICE.

To inquire into the nature of the work of pharmacy we find that, of necessity, there are divisions of pharmaceutical practice, and that there is the tendency to an extension of these divisions. Besides the final exercise of pharmacy in furnishing and adapting medical and chemical supplies to consumers, there is, *secondly*, the preparatory business of the wholesale druggist, who collects and distributes medical merchandise over the world, and, *thirdly*, the contributory service of the manufacturer. It is by virtue of the function of the dispensing pharmacist that the wholesale dealer and pharmaceutical manufacturer exist, while it would be hard to say which one of these branches contributes the most to the art and science and growth of pharmacy as a whole. It is the union of

them all that constitutes the pharmacy of to-day, the profession represented by this Association.

DISPENSING PRACTICE.

In the supply of medicines and chemicals to consumers it is especially the adaption of these supplies to specific uses and demands, as well as their valuation in terms of purity, quality, quantity and power, that marks the skilled profession. For this, special knowledge has accumulated for generations and great sciences have yielded up their latest discoveries. In this practice, pharmacy means safeguarding care and professional judgment as a basis of trust in the issues of life against death. It means resources for sanitation, public and private, when the plague is at the door. It requires acquaintance with the precise armentarium of pharmacology. It invites a provision of agencies for industrial arts and the refinement of homes. It puts a laboratory at the right hand of busy physicians and health officers. It is or may well be able to serve us as analyst and arbitrator in public inquiries as to pure drugs and pure foods, when the markets are crowded with strange inventions each more insistent than the other before it.

In this sphere of pharmacy it is undertaken to protect life against the mistakes of haste and oversight, against danger of poison in the hand of the irresponsible, against accident of any sort. But whatever liberty the law of the State allows to a responsible citizen in the choice of medicines, of open composition or otherwise, under advice of whatever practitioners of medicine, or without counsel of any, just the same measure of liberty on the part of the citizen is respected by the pharmacist. He is placed in charge of the agents of life that they shall not fail, and the agents of death that they shall not hurt, whether by ignorance or malice or the insane hand, while still he respects the right of sane persons asking in good faith for any medicine not contraband under the law. That the dispensing of medicines and poisons is obviously a profession of special skill, touching public safety in vital parts, is seen by the extent of State laws for the examination of pharmacists. Moreover, when there is legislation for pure drugs and foods, or to limit the freedom in use of misleading names of the same, there is usually imposed an added responsibility upon the pharmacist, requiring of him an increase of skill. To the Pharmacopœia itself is left the task, always responsible, and sometimes impracticable, of defining the limits of purity before the law.

The duty of the apothecary is of character, integrity and discretion, made more responsible by republican freedom, and *well indeed has the duty been done by the body of good and faithful servants at large* in the years of the century coming to a close. The many of this honorable guild have held unmoved the confidence and respect of the public in all our States and provinces, though not without loss by the sins of an unworthy few.

It is an added duty in the supply of medical merchandise to consumers to regulate the prices of sale. This is economics as applied to the sale of the materials belonging to a skilled profession. People are properly somewhat averse to unskilled hands for the supply of any sort of medicines. The economics of pharmacy call for local organization, friendly co-operation, and representation in national councils. No one of the economical problems of the day is entitled to a more careful study than this of the drug trade. It needs the sagacious good sense of men of experience, with whatever light the laws of commercial science can afford. Without a personal acquaintance with details in this subject, I yet desire to express the reasonable belief that cut-rate competition against regular rates, for either materials or services in any skilled profession, is always to be guarded against as demoralizing to social order and inimical to public good.

These, it seems to me, are some of the features of pharmacy in the supply of pharmacological and chemical agents to consumers, the largest of the branches of the profession. In another branch of practice lies the collection of drugs and medicines, and their distribution in all parts of the world.

THE WHOLESALE BUSINESS.

The wholesale and importing trade deals with all countries and peoples. It requires a range of technical skill and experience that it must largely gain for itself, with the use of special sciences but poorly provided in universities hitherto, and now only partly indicated under the term pharmacognosy. It performs a service of extensive scientific import and wide economic influence. It deals with certain plants in every part of the world, what they yield in given stages of their growth as affected by soil, climate and culture, as collected and cured and handled by various races of men, as treated in the marts of trade, and as found in the final quest of the analyst. It must know tropical agriculture, the industrial customs of various lands, the ins and outs of international commerce. It is a missionary of commercial economics. The importing and international drug trade possesses the material for much instruction in the higher commercialism, being established to equip men for our consular service and for our colonial mercantile houses. It has its specialists who ought to give lectures in the economic departments of universities, and it should have its special students who would hear such lectures.

When, in 1874, the Pharmacographia of Flückiger and Hanbury was published in London, the phrase "the history of drugs" took on a larger meaning in the English tongue, and a new period of pharmaceutical literature was entered. The impulse to that literature gained strength from English trade with the East, stimulated by the trade of Britain with her colonies. The time has come when the American drug trade is to receive such stimuli in its relations to tropical countries and profit by the same, with characteristic adaptation of new methods. To this end are wanted all helps of physical and plant geography, vegetable physiology and agriculture, botanical gardens, drug plantations and analytical laboratories.

Undertakings such as these must have financial support, and among the best business men of the United States are those most likely to furnish this basis, as they see advantage to come of it. The members of this Association know persons who are at once possessed of large capacity in successful business and of quick foresight into the open door of scientific discovery.

MANUFACTURING PHARMACY.

In the *third* place, as a distinct branch of the profession of pharmacy, has already been enumerated pharmaceutical manufacture. The preparation of medicines is no less a part of pharmacy when in the division of labor certain persons do nothing else. To what extent the preparation of medicines ought to be specialized is not within present discussion. Its limitation is but partly in the power of the dispensing pharmacist, or of any one. At any rate it is among the results of manufacture on the large scale that it can utilize much unskilled labor and mechanical power, and also that it is able to engage highly skilled service in positions of control. Therefore, it is feasible in large establishments, to organize investigations for the improvement of manufacture and adaptation of materials. The analytical laboratory controls the quality of raw material in its purchase, and checks the quantity of articles in the output of production. The standards and stipulations of the Pharmacopœia are put to the test of daily systematic application. When we canvass the literature of research in our profession we find very great indebtedness to the manufacturing houses, both those of this country and those of Europe. And manufacture has been represented in this Association by the names of men whom all delight to honor.

As the several branches of pharmacy are the complements of each other in service to the public, they are contributors to each other in science. *In the main their interests are in common.*

THE TEACHERS.

With the practitioners of pharmacy in its several divisions of labor belong the teachers

of pharmacy and of the sciences applied in its practice. Pharmacy has been sometimes the parent and sometimes the child of chemistry, of botany, of pharmacology. The relation of the apothecary's art to modern science is not estimated at full value. Research came out of pharmacy in the last century, and will return thereto in the next. Now whatever learning may claim for itself, it may claim for its teachers as well. Teachers in college must be in touch with the activities of life. If able to teach or to learn they must be hand-in-hand with the things that are taught, as these are worked out in the world. For it is things and not theories that are taught in colleges. Time has passed when a college can continue to live shut in from the breath of life, the field of action. Here are the telephone, the ice-making machine, the coal-tar products—they are not theories, they are facts and to be taught as such.

Actual business interest never works against the interest of science, in the final test. In the universities at present there are being established broad and unbiased studies of industrial economy and higher commercialism. In our trade associations measures of relief are being put to trial by men of practical vigor. Each set of workers may and will learn from the other, and add to the common stock of advantage.

SPECIALIZATION.

With this view of the extended range of pharmaceutical sciences, and the separate branches of pharmaceutical practice, we should be ready to welcome the service of specialists and to provide for their training, all in the fold of pharmacy. As truly as we have retail and wholesale manufacturing houses, or as different men do different things in a common drug store, so surely must each line of practice employ scientific specialists in its own range of work.

It is not *every* druggist that is to open an analytical laboratory for the aid of busy physicians and health officers; it is but enough to meet the demand, and a very good beginning has been made in many places. Already bacteriology is an employment, usually with other duty, in a few retail establishments; the call for it is increasing without doubt, and by all means to be cultivated, but I do not think it likely that the majority of graduates in pharmacy will ever be competent bacteriologists. The same may be said of physiological chemistry, and of practical pharmacology. The latter is in increasing demand, is extensively required now in manufacturing houses, and may become important as an analytical method in valuation. Food and water analyses, as specialties, belong in the profession of pharmacy, of course not exclusively. Advanced pharmacognosy has already been mentioned as a specialty in wholesale work. Analytical chemistry, the earliest of these applications of science, is now well established in a large number of houses—retail, wholesale and manufacturing—and is finding the economical limit of its usefulness, which extends as the standards of the Pharmacopœia are more and more enforced. Next in the advance is the carrying of chemical analysis into organic work and the estimation of potent principles, a science for which pharmacy is mainly responsible, and most directly interested. There will be more use of these several sciences in the practice of pharmacy when the sciences make themselves more capable to answer its practical questions.

The training for these specialties, as it seems to me, can be carried as advanced studies in the colleges of pharmacy in one of two ways, or in both. First, undergraduate time can be found for one advanced study which each student must elect from among several offered. Second, the several advanced studies can be offered to graduate students, some of whom would select one or more of these studies for graduate work in training for special service. The regular studies should not be supplanted by the specialties. In going beyond the regular studies a student gains more by thorough work in one subject than by scattered work in various subjects. Finally, students of insufficient preparatory education can not take advanced studies with advantage. And graduates

who have shown inaptitude for scientific service may well be advised against undertaking to prepare for it.

While colleges and universities, in possession of libraries and laboratories and museums and teaching specialists, are the natural centers of specialization and research, these are also highly developed in the larger business establishments, equipped as they may be in the means of investigation. And solitary workers, as well, contribute a great deal to the enlargement of science and the enriching of its literature, personal power overcoming hindrances and making an environment for itself.

LITERATURE FOR RESEARCH.

For specialization or research the first necessity is the use of a library. A pharmacist is in some part like a lawyer, he becomes an authority not by knowing books, but by knowing how to use books. Certainly one who through publication would add to human knowledge upon any question of fact must first find out pretty well what is already in publication upon that question. It is much of the educational value of research work that in order to reach a new fact the worker becomes an authority upon a class of facts.

So then to place the current publication of pharmaceutical research, convenient for reference, at the hand of every man in pharmacy, is to put the professional power of the world in his support. A single journal of research does something, in an inspiring way, but it is too small a part of the journalistic literature to be a dependence for all uses. The pharmaceutical press, worthy of all praise for its stimulating influence, is mainly ephemeral in its uses. There is the want, for the average pharmacist, of a compact summary of all research in our profession. To serve between the uses of the Pharmacopœia and its commentaries on the one side, and the voluminous pharmaceutical press on the other side, such a summary is preferably to be a book-form annual, standing as it does for the best features of a library of pharmacy. *Such a summary we have* in the "Report on the Progress of Pharmacy" issued by this Association. Its volumes for a series of years make a library of research in brief, inestimable to practitioners not having access to libraries in the large. Its importance and its improvement are to be commended to the care and interest of the Council, the entire membership, and all English-reading pharmacists in the world.

THE MEANS FOR ADVANCEMENT.

To give pharmacy its due place in science and its due profit in industry, it must act as one of the leaders in investigation. There must be foundations for research, libraries and laboratories equipped, groups of collections and experimental plantations. I am inclined to believe that if the people of pharmacy were fully awake in their minds, and fully alive in their hearts, it would be found that there is money waiting to support the highest and best work that can be done. We have had marked examples of large and far-seeing benefaction for the good and the credit of our guild. Toward such examples the pharmaceutical public cannot afford to be apathetic.

If a larger body of practitioners would at least assume membership subscriptions for themselves, it would do much to open the door to generous bequests. It is a trait of the time for large numbers to assess themselves in small sums for the carrying forward of great efforts. Measures in philanthropy, in religion, and in art are so realized. Insurance illustrates a like method of voluntary taxation, which is also seen in trade organizations.

SOCIETIES.

We have various organizations in pharmacy, to be sure; it would be unnatural if we did not. As in other pursuits, it seems for a moment that interests suffer from an excess of organization. But on consideration we can only regret that the organizations of pharmacy one and all are not more widely and vigorously supported.

The separate organization of retail practitioners two years ago, upon commercial matters only, in a national body representative of local unions, was but the specialization of effort in the face of difficulty, inevitable and surely desirable. The movement as a whole has been fortunate in the manner in which it has been carried out, prudent and temperate and steadfast, commanding general respect. The State societies have fulfilled a function for many years, invaluable in State legislation, useful in commercial conference, refreshing in personal acquaintance. The separate local societies of employees in pharmacy have proven of much benefit in many places. In some of the cities the appeal of the united drug clerks for a higher standard of admission to pharmacy has gained a most creditable response from the newspaper press. In these and other bodies it is exemplified that specialized organization is helpful, while a general organization is necessary to professional life.

Forty-eight years ago an American Association of Pharmacists had become as inevitable as the rising of the sun. Since then every decade has given added importance to this one general society, as a union of all specialties of practice and study, binding their interests together and coördinating the sciences to the work of the day. A great opportunity lies before this body, appealing to the professional spirit of every one who has anything to do in pharmacy and offering advantage in every part of the drug business.

THE RESULTS OF THIS ASSOCIATION.

The more essential objects of this body, set forth in Article I. of the Constitution, have been gained, step by step and year by year, so remarkably as to give assurance of acceleration in advance. These are the methods: to regulate the drug market by correcting the quality of drugs; to strengthen pharmacy by the cultivation of its sciences; to unburden the profession by restricting its practice to those who are qualified; to command confidence by education and by integrity. In purpose of this character lies the inherent value of pharmacy, by virtue of which it has vitality to live and to triumph over obstacles.

This Association has been throughout in the hands of men of sterling worth, and they have fixed its affairs upon a basis of systematic stability. An incorporated body, whose permanent Board is elective by contributing members of a staunch profession, it gives prudential assurance that whatever is committed to its charge will be invested and applied to accomplish its utmost with increase.

Moreover, it is among the benefits of this Association to widen the outlook and correct provincialism. An inter-state body, with international offices, it brings together fellow-workers from distant parts and enables one to see from another point of view.

AS TO RECOMMENDATIONS.

I desire to speak for an enlarged membership, for hearty fellowship within the Association, for zeal in the work before it. In the situation of pharmacy, as I have endeavored to portray it, lies the reason why pharmacists should become the constituents of this organization in numbers to make it widely representative.

This is the one recommendation that is made in the annual address of your President this year, made not so much to this meeting as to the pharmacists of the States, the recommendation of membership, fellowship and zeal in the work. Upon mature thought I do not propose any resolution for the consideration of the committee upon the address and for action in the General Session. No vote that can be taken in either of the meetings, touching any measure, would be so desirable in its results as will be the unity of interest and confident determination of the men of pharmacy at large.

I beg leave, however, to ask the Committee upon the President's Address, should they find upon conference with each other that they have a motion to make bearing upon the policy or the efforts of the Association, that they will formulate the same for action in the General Session at the usual time.

In the meeting now opening let us engage with cordial earnestness in the important business before us, so equalizing our discussions that every one may be heard, with the best division of our time. And we shall not forget that we are here for personal acquaintance, each with every other. May the Richmond meeting of 1900, the second meeting in this city of interest, be memorable for help and happiness to every member.

Prolonged applause followed the reading of the address of the President.

THE CHAIRMAN: Gentlemen, you have heard the very interesting and able address of our President. It is now before the Association for action. What is your pleasure?

Mr. Mayo moved to refer to a committee of three, to be appointed by the President, for consideration and report at a later session.

The motion was duly seconded and carried.

The Chairman announced that the committee would be appointed before adjournment.

The Chair called for the report of the Committee on Credentials, Mr. F. G. Ryan, Chairman, and that gentleman read the report as follows:

REPORT OF COMMITTEE ON CREDENTIALS.

The Committee on Credentials, appointed by the Chairman of the Council, reports the following credentials as having been received and accepted:

National Associations—National Wholesale Druggists' Association, National Association of Retail Druggists—2.

State Pharmaceutical Associations—Arkansas, Alabama, California, Connecticut, Georgia, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, North Dakota, North Carolina, New Jersey, New York, Ohio, Pennsylvania, Tennessee, Texas, Vermont, Wisconsin—25.

Colleges of Pharmacy—Albany, Chicago, Cleveland, Louisville, Maryland, Massachusetts, National, Pittsburg, Philadelphia—9.

Schools of Pharmacy—Medico-Chirurgical College of Philadelphia, Northwestern University, University of Minnesota, University of Wisconsin—4.

Alumni Associations of Colleges of Pharmacy—Maryland, New York, Philadelphia—3.

Local Associations—Cincinnati Academy of Pharmacy, German Apothecaries' Society of the City of New York, Kings County Pharm. Society, Manhattan Pharm. Association, New Yorker Deutscher Apotheker-Verein, Northern Ohio Druggists' Association—6.

F. G. RYAN, *Chairman*,
CLAY W. HOLMES,
HENRY BIROTH.

Mr. Ebert, duly seconded, moved to receive the report and adopt it as read. Carried.

THE CHAIRMAN: The next business in order is action on the proposed amendments to the Constitution, reported from the forty-seventh annual meeting at Put-in-Bay last year. The Secretary will read the amendments.

The Secretary read the amendments as follows:

Amend Article IV. as follows: Strike out the word "annual" in the third line, and the words "shall" and "current" in the fourth line, and insert the words, "for any curren

year," after the word "which" in the third line, and the word "may" after the word "only" in the fourth line, so as to read, "the interest of which for any current year only may be used by the Association for its expenses."

Amend Article V. as follows: At the close of the paragraph add, "Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association shall require a majority of seven-eighths for its passage."

THE CHAIRMAN: You have heard the amendments read, gentlemen. What is your pleasure?

Mr. Seabury, seconded by Mr. Sheppard, moved that the amendments as read by the Secretary be adopted. Carried.

THE CHAIRMAN: Are there any delegates representing the various Associations present, such as the National Association of Retail Druggists, National Wholesale Druggists' Association, and Proprietors' Association? If there are, we will be pleased to hear from them.

There was no response to the invitation of the Chair.

THE CHAIRMAN: The next thing in order, then, will be the report of the various committees, and the Secretary will please call the committees.

THE SECRETARY: The reports of committees will be called for, read by title only, or a synopsis given, and laid on the table for future consideration.

The Secretary then called the following:

Committee on Transportation—Chas. Caspari, Jr., Chairman.
" " *Revision U. S. Pharmacopœia*—Leo Eliel, Chairman.
" " *General Prizes*—Wm. M. Searby, Chairman.
" " *National Legislation*—F. E. Stewart, Chairman.
" " *Weights and Measures*—F. G. Ryan, Chairman.
" " *Excursion to Europe*—C. A. Mayo, Chairman.
" " *Semi-Centennial Meeting*—J. M. Good, Chairman.
" " *Status of Pharmacists in Government Employ*—Geo. F. Payne, Chairman.

Delegates to Section on Materia Medica, Pharmacy and Therapeutics of the American Medical Association—A. B. Lyons, Chairman.

Delegates to National Wholesale Druggists' Association—Geo. L. Hechler, Chairman.

Delegates to National Association of Retail Druggists—J. M. Good, Chairman.

Delegates to National Pure Food and Drug Congress—J F. Geisler, Chairman.

Delegates to the Eighth Decennial Convention for Revising the United States Pharmacopœia—W. S. Thompson, Chairman.

THE CHAIRMAN: The next order of business is the reading of the Minutes of the Council by the Secretary of the Council.

Mr. Kennedy read the Minutes of the first meeting of the Council, held at Richmond, as follows:

FOURTH SESSION OF THE COUNCIL—MAY 7, 1900.

A quorum of the Council having assembled at the Jefferson Hotel, Richmond, Va., the Chairman, Wm. S. Thompson, called the meeting to order at 10 o'clock a. m., with the following members present: Messrs. Caspari, Diehl, Dohme, Good, Hopp, Kennedy, Mayo, Prescott, Rapelye, Ryan, Sheppard and Whelpley.

The Secretary of Council submitted the following items of business, which had come before Council since last meeting and had been disposed of by correspondonee:

POTTSVILLE, PA., *September 30, 1899.*

Dear Sir: It is moved by H. M. Whelpley and seconded by S. A. D. Sheppard that the Committee on Publication be instructed to issue the 1899 volume of Proceedings in a heavier and more durable quality of binding.

Please send your vote to the undersigned.

Yours respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Caspari, Dewoody, Dohme, Eliel, Frost, Good, Gray, Kennedy, Mayo, Prescott, Rapelye, Ryan, Sheppard, Thompson, Whelpley—15.

Nays—Main, Miller, Whitney—3.

Conditional—Diehl, Lowe—2.

Not voting—Hopp—1.

The motion was adopted.

POTTSVILLE, PA., *October 10, 1899.*

Dear Sir: WHEREAS, the Council has been charged with fixing the date of the 48th annual meeting, which is to be held immediately after the Convention for Revision of the United States Pharmacopœia,

And, whereas, the latter convention will meet in Washington City, May 2d to 4th, 1900:

It is therefore moved by Chas. Caspari, Jr., and seconded by W. S. Thompson, that the next annual meeting of this Association be held at Richmond, Va., May 7th to 12th, 1900.

Please send your vote to the undersigned.

Yours respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas — Caspari, Dewoody, Diehl, Dohme, Eliel, Frost, Good, Gray, Hopp, Kennedy, Lowe, Main, Mayo, Miller, Prescott, Rapelye, Ryan, Sheppard, Thompson, Whelpley and Whitney—21.

Nays—0.

The motion was unanimously adopted.

POTTSVILLE, PA., *October 23, 1899.*

Dear Sir: It is moved by H. M. Whelpley and seconded by J. M. Good that an appropriation of $100 be made for the use of the Committee on Membership.

Please send your vote to the undersigned.

Yours respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Dewoody, Diehl, Dohme, Eliel, Frost, Good, Gray, Hopp, Kennedy, Lowe, Main, Mayo, Miller, Prescott, Rapelye, Ryan, Sheppard, Thompson, Whelpley and Whitney—20.

Nays—0.

Not Voting—Caspari.

The motion was adopted.

POTTSVILLE, PA., *October* 24, 1899.

Dear Sir: WHEREAS, a recommendation submitted by the Finance Committee for 1898–1899, and adopted by the Council and approved by the Association on September 8, 1899, at the forty-seventh annual meeting, directs that the Treasurer shall transfer the Life Membership Fund, the Ebert Prize Fund and the Centennial Fund from the Savings Bank of Dover, N. H., to the Philadelphia Saving Fund;

And, whereas, it appears from information received from Prof. J. P. Remington, late Chairman of the Finance Committee, that the phraseology of the recommendation above referred to is defective and should be changed;

It is therefore moved by Chas. Caspari, Jr., and seconded by Geo. W. Kennedy, that the recommendation of September 8th, 1899, be hereby repealed, and in its place the following be adopted:

That the Chairman of the Council be instructed to transfer the accounts of the several funds of the Association, now on deposit in the savings bank of Dover, N. H., to the Fidelity Insurance, Trust and Safe Deposit Company of Philadelphia, Pa.

Please send your vote to the undersigned.

Yours respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas — Caspari, Dewoody, Diehl, Dohme, Eliel, Frost, Good, Gray, Hopp, Kennedy, Lowe, Main, Mayo, Miller, Prescott, Rapelye, Ryan, Sheppard, Thompson, Whelpley and Whitney—21.

The motion was unanimously adopted.

POTTSVILLE, PA., *January* 15, 1900.

Dear Sir: The Council and the Association at large having authorized the preparation of an Epitome of the National Formulary for the special use of physicians, and the manuscript for said Epitome being now complete, it is moved by Chas. Caspari, Jr., seconded by C. Lewis Diehl, that the Publication Committee be instructed to have 10,000 copies of the Epitome printed at the lowest price obtainable commensurate with good workmanship. And, further, that the Committee be authorized to have as many copies of the Epitome bound as may, in their judgment, be requisite for present wants.

Please send your vote to the undersigned.

Yours respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Caspari, Dewoody, Diehl, Dohme, Frost, Good, Gray, Hopp, Kennedy, Lowe, Main, Mayo, Miller, Prescott, Rapelye, Ryan, Sheppard, Thompson, Whelpley, Whitney —20.

Nays—0.

Not voting—Eliel—1.

The motion was adopted.

POTTSVILLE, PA., *February 2, 1900.*

Dear Sir: The Treasurer having reported a temporary shortage of money, due to delayed settlement by members of annual dues for 1899, and his consequent inability to meet payment of bills for the publication of the Proceedings and other current expenses of the Association, it is moved by Chas. E. Dohme, seconded by Thos. F. Main and Chas. A. Rapelye, constituting the Finance Committee, that the Treasurer be directed to make a loan of $1,000 for three months at 5 per cent., and to issue a promissory note for said loan in the name of the Association, said note to be signed by the Treasurer and the Chairman of the Council, and to be negotiated by the Chairman of the Council, with authority to deposit as collateral the bonds belonging to the General Fund, now in his custody.

Please send your vote to the undersigned.

Yours respectfully. GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Caspari, Dewoody, Diehl, Dohme, Eliel, Frost, Good, Gray, Hopp, Kennedy, Lowe, Main, Mayo, Miller, Prescott, Rapelye, Ryan, Sheppard, Thompson, Whelpley and Whitney—21.

The motion was unanimously adopted.

POTTSVILLE, PA., *February 25, 1900.*

Dear Sir: It is moved by S. A. D. Sheppard, and seconded by Charles Caspari, Jr., that Henry C Porter, of Towanda, Pa., be allowed to withdraw his resignation and thereby be reinstated as a member.

Yours respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Caspari, Dewoody, Diehl, Dohme, Eliel, Frost, Good, Gray, Hopp, Kennedy, Lowe, Main, Mayo, Miller, Prescott, Rapelye, Ryan, Sheppard, Thompson, Whelpley and Whitney—21.

The motion was unanimously adopted.

POTTSVILLE, PA., *March 29, 1900.*

Dear Sir: It is moved by Chas. Caspari, Jr., and seconded by George W. Kennedy, that the General Secretary be authorized to have made forty gold bars for the forty-eighth annual meeting, to be held at Richmond, Va., May 7th to 12th.

Please send your vote to the undersigned.

Yours respectfully, GEO. W. KENNEDY, *Secretary of Council.*

Yeas—Caspari, Dewoody, Dohme, Eliel, Frost, Good, Gray, Kennedy, Lowe, Main, Mayo, Miller, Prescott, Rapelye, Ryan, Sheppard, Thompson, Whitney and Whelpley—19.

Nays—0.

Not Voting—Diehl, Hopp—2.

The motion was adopted.

POTTSVILLE, PA., *March* 30, 1900.

Dear Sir: In accordance with the resoluion of Council, approved by the Association at large, the following programme for the forty-eighth annual meeting is submitted by Chas. Caspari, Jr., General Secretary; T. Ashby Miller, Local Secretary; and Geo. W. Kennedy, Secretary of the Council:

PROGRAMME.

Monday, May 7th.

10.00 a. m. Session of the Council.
3.00 p. m. First General Session.
8.30 p. m. Reception to Visitors.

Tuesday, May 8th.

9.00 a. m. Second General Session.
12.00 p. m. Carriage Drive.
3.30 p. m. First Session of Section on Commercial Interests.
8.30 p. m. Concert.

Wednesday, May 9th.

10.00 a. m. Second Session of Section on Commercial Interests.
3.30 p. m. First Session of Section on Scientific Papers.
8.00 p. m. Second Session of Section on Scientific Papers.

Thursday, May 10th.

9.00 a. m. Trip to Old Point Comfort *via.* C. & O. R. R., returning about 7 p. m.

Friday, May 11th.

9.00 a. m. Third Session of Section on Scientific Papers.
2.00 p. m. First Session of Section on Education and Legislation.
4.30 p. m. Trolley-car Ride.
8.30 p. m. Second Session of Section on Education and Legislation.

Saturday, May 12th.

10.00 a. m. Third Session of Section on Education and Legislation.
3.00 p. m. Final General Session.
8.30 p. m. Entertainment in Roof Garden of Hotel Jeffersen.

Please send your vote on the adoption of the above programme to the undersigned.

Yours respectfuily, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Caspari, Dewoody, Dohme, Eliel, Frost, Good, Gray, Hopp, Kennedy, Main, Mayo, Miller, Prescott, Rapelye, Ryan, Sheppard, Thompson, Whelpley and Whitney—19.

Nays—0.

Not voting—Diehl, Lowe—2.

The motion was adopted.

The committee instructed to report at this meeting rules and directions for auditing the books, accounts and funds of the Association, and consisting of the Chairman of Council, Treasurer and General Secretary, stated that their report was not ready, but would be submitted at a later session.

The General Secretary, having been authorized to have forty gold bars made for the Richmond Meeting, reported that but thirty had been made, being considered sufficient in number.

Chairman Thompson appointed Messrs. F. G. Ryan, C. W. Holmes and H. Biroth a Committee on Credentials with directions to report direct to the Association.

The Secretary of the Committee on Membership read the names of seventy-seven applicants for membership, which on motion of G. W. Kennedy were referred to the Association for action.

Geo. W. Kennedy, Secretary, presented the report of the Committee on Membership, which was on motion accepted and referred to the Association at large.

Chas. Caspari, Jr., read the following report of the Committee on Publication. The same was on motion received and adopted.

REPORT OF THE COMMITTEE ON PUBLICATION.

To the Chairman and Members of the Council of the American Pharmaceutical Association:

Gentlemen: Your Committee on Publication beg leave to report that the Proceedings of the forty-seventh annual meeting have been published and a copy of the same delivered in the latter part of December, 1899, to every member entitled thereto, according to the Treasurer's accounts, besides about 100 complimentary copies to our honorary members, state libraries, educational institutions and foreign scientific bodies. It is gratifying to know that the change of time allowed for the issue of the Proceedings, from 70 to 100 working days, which was approved by the Association at the last annual meeting, has enabled the editor to comply fully with the rule, although this was also in part due to the smaller size of the published volume (922 pages, instead of 1255 of last year.) Fourteen hundred copies of the book were printed, of which 285 have been allowed to remain in flat sheets; 1050 copies have been bound in cloth and 65 copies in paper cover, of which 5 remain on hand at the present date. In accordance with instruction of the Council, a somewhat heavier cloth, known as "art vellum," has been

used for the binding, which, it is hoped, will overcome the objections made to former bindings. It was found necessary also to bind in cloth 40 copies of the 1897 volume of Proceedings, the stock having become exhausted. Owing to the smaller size of the 1899 volume, the cost of publication and delivery was much less than last year, as shown by the following items:

Composition, paper and presswork (1400 copies)		$1597 59
Binding 1050 copies in cloth, @ 23 cents	$241 50	
" 40 " " " @ 20 cents	8 00	
" 65 " " paper, @ 8 cents	5 20	
		254 20
Expressage and postage: Expressage (cloth, 26 cents; paper, 21 cents); Postage (cloth, 27 cents; paper, 24 cents)		320 30
Illustrations		45 24
Journals for the Reporter		45 64
Labels		4 50
Expense of assistance in proof-reading, etc.		31 75
Salary of the Stenographer		150 00
Salary of the Reporter on Progress of Pharmacy		750 00
		$3,199 22

In accordance with a motion adopted by the Council, January 17, 1900, your Committee has undertaken the publication of a Physicians' Epitome of the National Formulary, as authorized by the Association at its last annual meeting. A contract for printing 10,000 copies has been awarded to the Wickersham Printing Co. as the lowest bidders, and the text has been cast in electrotype plates for future use.

The binding of the Epitome will be in flexible cover of linen cloth (samples of the bound booklet are ready for inspection). It is urgently hoped that members will avail themselves of the opportunity now presented for supplying themselves and their respective State Associations with this very desirable and convenient synopsis of the National Formulary for physicians' use. For prices and further information, application should be made to the General Secretary. CHAS. CASPARI, JR., *Chairman.*

The Centennial Fund Committee reported that no application had been received for the benefits of the fund.

S. A. D. Sheppard moved, seconded by Chas. Caspari, Jr., that our hearty thanks be and hereby are tendered to the Chairman of the Committee on Membership for his valuable services, which was unanimously adopted.

Chas. A. Rapelye, Chairman, submitted the following report of the Auditing Committee, which was on motion accepted:

HARTFORD, CONN., *April 26, 1900.*

To the Chairman of the Council of the American Pharmaceutical Association:

Sir: The undersigned Committee appointed to audit the books of the Treasurer, General Secretary and Chairman of the Council report that they have examined and compared the books, accounts and vouchers of the said several officers, that they have compared and checked all items of receipt and expenditure, have examined and counted the bonds and certificates representing the invested funds of the Association, and have also checked the bank books for the sums deposited during the period covered from July 1, 1899, to April 1, 1900. We further report that the books and accounts of the several officers are carefully and accurately kept, and that all disbursements have been properly made and are attested by properly executed vouchers, and that we find all funds of the Association carefully recorded and accounted for.

Respectfully submitted,

CHAS. A. RAPELYE,
PHILO W. NEWTON,
T. R. SHANNON.

The Treasurer, S. A. D. Sheppard, presented his report for the nine months ending April 1, 1900, which was, on motion, referred to the Association.

S. A. D. Sheppard moved, seconded by G. W. Kennedy, that in order to bring the payments of salaries within each current fiscal year, said payments shall be made in December and June, instead of as heretofore. This was unanimously adopted.

In order to carry into effect the action of Council in reference to the payment of salaries in December and June, the Finance Committee recommended an appropriation of of $1400.00 to be added to the appropriations on account of salaries for the present fiscal year. On motion of J. M. Good, duly seconded, the recommendation was adopted.

It was moved by J. M. Good, seconded by C. E. Dohme, that the Treasurer be instructed to send to the General Secretary, for publication in the Proceedings for 1900, a statement of receipts and expenditures from April 1 to June 30, 1900; also, the usual list of payments and a summary of disbursements for the fiscal year 1899 to 1900. This motion was unanimously adopted.

On motion of S. A. D. Sheppard, seconded by G. W. Kennedy, the General Secretary was instructed to drop the names of life members from the list when their residence has been unknown for five consecutive years, and to have a note of such action printed at the end of the roll of members for that year.

It was moved by S. A. D. Sheppard, seconded by G. W. Kennedy, that the Chairman of the Council and the Treasurer be instructed to sell the bonds belonging to the General Fund, and to place one thousand dollars of the proceeds into the treasury and the balance in the Life Membership Fund. This motion was adopted.

S. A. D. Sheppard moved, seconded by H. M. Whelpley, that another rule be added to the General Rules of Finance, the same to be as follows:

Fourteenth. Whenever, in the judgment of the Finance Committee, it shall be necessary, they shall send a written order to the Treasurer, signed by at least two members of said Committee, directing him to use the whole or a portion of the interest of the Life Membership Fund for the current year to defray the expenses of the Association.

This motion was unanimously adopted.

It was moved by C. E. Dohme, seconded by C. A. Rapelye, that the Chairman of the Council, and the Treasurer, acting jointly, be authorized to pay the promissory demand note for one thousand dollars, now outstanding against the Association, at such time during the coming year as they may deem expedient. This motion was adopted.

C. Lewis Diehl having asked for instructions as to the time when his Report on the Progress of Pharmacy for 1899–1900 shall be ready for publication, it was moved by A. B. Prescott, seconded by Lewis C. Hopp, that the date of the issue of the Proceedings for 1900 be extended to November 15, 1900, and that the pharmaceutical press be requested to publish the reason for this exceptional delay, namely: to enable the Reporter on the Progress of Pharmacy to make his annual report cover publications up to July 1, 1900, irrespective of the unusually early date of the present meeting, and in accordance with Article IV. of Chapter V. of the By-Laws. This motion was unanimously adopted.

On motion of H. M. Whelpley, seconded by G. W. Kennedy, the subject of remuneration for the work in preparing the Epitome of the National Formulary was referred to the Chairman of the Publication Committee and the Committee on Finance.

On motion of S. A. D. Sheppard, duly seconded, it was agreed that the Council hold daily meetings at 9.30 a. m.

On motion, Council adjourned.

GEO. W. KENNEDY, *Secretary.*

Mr. Whelpley, seconded by Mr. Simpson, moved that the minutes of the Council be adopted as read. Carried.

THE CHAIRMAN: It is time now for the appointment of the Nominating Committee,

and it is customary to take a recess of five or ten minutes, in order that the members present from the various States may select their representatives on the Committee. A motion to that effect will be in order. Before that motion is put, however, I would like to read a part of Section 6, of Article XI, Chapter VIII, of the By-Laws in regard to this Committee:

"Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee."

On motion of Mr. Mayo, the convention took a recess of ten minutes for the purpose indicated.

After the recess, the Chair called the Association to order.

THE CHAIRMAN: I wish to make the announcement that the memorial of Prof. William Procter, prepared by Mr. Remington in accordance with the resolution passed last year, will be read to-morrow morning after the report of the Nominating Committee.

MR. REMINGTON: I think a little explanation is needed in regard to this matter: At the meeting at Put-in-Bay a motion was made—I think by Mr. Ebert—that inasmuch as this meeting here at Richmond would be a reminder of the last meeting that Prof. William Procter attended, which was at Richmond in 1873, and inasmuch as he was one of the founders of the American Pharmaceutical Association, some recognition ought to be made of that fact, and I was requested to prepare a memorial of Prof. Procter to be read at this meeting, and if it is the wish of the Association I will read it to-morrow after the report of the Nominating Committee.

THE CHAIRMAN: I do not think it will require a motion at all. We will all understand that this memorial will be read to-morrow morning at the time indicated.

The Secretary will now call the roll of the States for the members of the Nominating Committee.

President Prescott resumed the chair.

The Secretary called the roll, and the following were named as members of the Nominating Committee from the various States, Territories and Provinces:

Arkansas — E. F. Klein, W. H. Skinner.
California — Miss J. E. Barbat, W. J. Jackson.
Connecticut — Jno. W. Lowe, Chas. A. Rapelye.
District of Columbia—W. S. Thompson.
Georgia—Joseph Jacobs, Geo. F. Payne.
Illinois—Henry Biroth, Oscar Oldberg.
Indiana — Chas. D. Knœfel, F. W. Meissner, Jr.
Iowa—S. R. Macy.
Kentucky—C. Lewis Diehl, C. S. Porter.
Maryland—D. Base, A. A. Quandt.
Massachusetts—E. L. Patch, B. F. Riddell.
Michigan—A. B. Lyons, A. B. Stevens.
Minnesota—Miss J. A. Wanous.
Missouri — H. M. Pettit, H. M. Whelpley.
New Jersey — D. L. Cameron, Geo. H. White.
New York—Geo. C. Diekman, R. G. Eccles.
North Carolina — J. Hal. Bobbit, Wm. Simpson.
Ohio—J. H. Beal, Theo. Wetterstroem.
Pennsylvania—C. N. Boyd, W. L. Cliffe.
South Carolina—O. E. Thomas.
Tennessee—A. B. Rains, J. F. Voigt.
Texas—E. G. Eberle.
Vermont—Collins Blakely.
Virginia—R. H. M. Harrison, W. H. Scott.
Wisconsin—Edw. Kremers.
Province of Quebec—S. Lachance.

THE SECRETARY: The President has also appointed as members-at-large of the Committee Messrs. Ebert, of Chicago; Hynson, of Baltimore; Good, of St. Louis; Remington, of Philadelphia, and Ruddiman, of Nashville.

MR. REMINGTON: I move we now adjourn.

THE PRESIDENT: Before we adjourn I want to appoint the Committee on Time and Place of Next Meeting. On that Committee I appoint Mr. Sheppard, of Boston, Chairman; and Messrs. Oldberg, of Chicago; Whelpley, of St. Louis; Alpers, of New York, and Thompson, of Washington.

I also desire to announce as the Committee on President's Address Mr. Lewis C. Hopp, Mr. William S. Thompson and Mr. Henry P. Hynson.

If there be no further business, Mr. Remington's motion to adjourn will now be in order.

Mr. Mayo seconded the motion, and the Association thereupon adjourned until to-morrow (Tuesday) morning at 9 o'clock.

SECOND SESSION—TUESDAY MORNING, MAY 8, 1900.

The second general session of the Association was called to order by the President at 9:30 a. m., in the large committee-room of the hotel (where all the succeeding sessions were held).

The Secretary read the minutes of the first session.

The Chair announced that if there were no corrections in the minutes as read, they would stand approved, and it was so ordered.

The Chair called for the report of the Committee on Nominations, and Mr. Whelpley read the report as follows:

REPORT OF THE NOMINATING COMMITTEE.

The Committee on Nominations beg leave to submit the following names of members selected after due deliberation, as desirable candidates for election as officers of the Association and members of the Council for the ensuing year:

For President—John F. Patton, of York, Pa.

For First Vice President—Jas. H. Beal, of Scio, O.

For Second Vice President—Jno. W. Gayle, of Frankfort, Ky.

For Third Vice President—E. A. Ruddiman, of Nashville, Tenn.

For Treasurer—S. A. D. Sheppard, of Boston, Mass.

For General Secretary—Chas. Caspari, Jr., of Baltimore, Md.

For Reporter on Progress of Pharmacy—C. Lewis Diehl, of Louisville, Ky.

For Members of the Council—T. Roberts Baker, of Richmond, Va.; Lewis C. Hopp, of Cleveland, O.; Henry P. Hynson, of Baltimore, Md.

JAS. M. GOOD, *Chairman.*

H. M. WHELPLEY, *Secretary.*

The Secretary explained that it was customary, in the matter of the candidate for President, to go through the form of taking a ballot, and the Chair ordered it to be done, and appointed tellers to take the vote.

The Secretary announced as the result of the vote that 44 votes had been cast for John F. Patton, of Pennsylvania, the nominee of the Committee, for President, and no negative votes.

Mr. Patton was thereupon declared by the Chair to be duly elected

President of the American Pharmaceutical Association for the ensuing year, and the announcement was heartily applauded.

Upon motion of Mr. Oldberg, the Secretary of the Council was ordered to cast the affirmative vote of the Association for the rest of the nominees named in the report.

Mr. Kennedy announced that he had obeyed instructions and cast the vote of the Association as follows:

First Vice President—James H. Beal, Scio, Ohio.

Second Vice President—John W. Gayle, Frankfort, Ky.

Third Vice President—E. A. Ruddiman, Nashville, Tenn.

Treasurer—S. A. D. Sheppard, Boston, Mass.

General Secretary—Chas. Caspari, Jr., Baltimore, Md.

Reporter on Progress of Pharmacy—C. Lewis Diehl, Louisville, Ky.

Council—T. Roberts Baker, Richmond; Lewis C. Hopp, Cleveland; H. P. Hynson, Baltimore.

The Chair accordingly declared these gentlemen duly elected to the offices designated.

Mr. Alpers rose to a question of privilege and stated that he had noticed in one of the morning papers a detailed account of the doings of the Nominating Committee last night, which surely was not in keeping with previous customs of the Association, and calculated to hurt the feelings of over-sensitive members. After prompt explanation by the Chairman and Secretary of the Committe that the information had not been given out by the Committee, but had been obtained by some over-zealous reporter, accidentally present in the room, apologies were offered and accepted, and the regular order of business was resumed.

THE PRESIDENT: We have now as a special order at this hour the memorial report upon Prof. William Procter, of Philadelphia, written by Mr. Remington. Mr. Remington will kindly favor us now.

MR. REMINGTON: I will say, Mr. President, that the significance at this time of reading this memorial is due mainly to the initiative of Mr. Ebert, of Chicago, who last year at Put-in-Bay called attention to the fact that the great work which was done by Prof. Procter as one of the founders of this Association was in danger of being set aside by the lapse of time, and that the younger members should know something of his work. After consultation, it was decided to ask me to present this memorial. It may be proper to say that the last meeting which Prof. Procter attended, which occurred at Richmond 27 years ago, was one of the first meetings I had the honor of attending. At that time I was an assistant to Prof. Procter, and Mrs. Procter, knowing that he was in ill health and had heart disease, made the request that I should be with him all the time. This was not only a duty I owed him, but a pleasure as well, and I occupied the same room with him here, and looked after his health as best I could. As you probably know, he only lived a few months after that meeting, dying in March, 1874.

Mr. Remington then read the following memorial:

A MEMORIAL OF WILLIAM PROCTER, JR.*

BY JOSEPH P. REMINGTON.

This distinguished pharmacist was born in the city of Baltimore, May 3, 1817. His parental ancestry can be traced to Thomas Procter, the great-great grandfather of William Procter, Jr., who was an officer in the army of Oliver Cromwell. The descendants of Thomas Procter became converts to the doctrines of George Fox, and they are early recorded as members of the religious Society of Friends. Isaac Procter, who was the father of William Procter, Jr., and a most exemplary man, was encouraged through the advice of a relative, Lindley Murray, the grammarian, to emigrate to America, and after due deliberation he determined to make America his future home. He arrived in the ship "William Penn," in September, 1793, but owing to the prevalence of yellow fever in Philadelphia at that time, the ship was not allowed to come up to the city. The passengers were landed at Gloucester, New Jersey, and the ship then proceeded to New York to discharge her cargo. Isaac Procter, with two companions, was compelled to walk to New York, stopping at various Friends' houses on the way. He was fortunately not quarantined, and at last arrived safely in New York, but the fever soon broke out in that city, prostrating business and compelling all who could to leave the city. Isaac Procter therefore sought employment in the country. Upon his return to the city, some of his friends, of whom he had already won many by his manly conduct and high religious character, advised him to engage in the hardware business in Baltimore. He decided to do so, and opened a store at the corner of Market and Hanover Streets, which he succeeded in making one of the best known of its kind in the country.

On November 3, 1799, he was married at the meeting house at Fallsington, Pennsylvania, to Rebecca Farquhar, whom he had met seven years before while on his way to New York from the vessel in which had landed.

William Procter, the subject of this sketch, was their ninth and youngest child. Three years after William's birth, Isaac Procter, the father, died, and it is remarkable that, having escaped death from yellow fever a number of times, he should at last have succumbed to the disease on the 7th of July, 1820. After the father's death, unexpected claims were made upon the estate, which, although considered by the family unjust, were not resisted, and William Procter was deprived of the liberal education that would have been so enjoyable and advantageous to one of his natural abilities. A companion of his boyhood writes: "We were boys together from from six to ten years of age at a Friends' school in Baltimore, taught by a lady of rare gifts and attainments. He was studious, gentle and companionable, and greatly beloved by his teachers and classmates. His powers of observation were very early developed, and as a child, nothing escaped his notice; he would interest boys in stones that he would pick up on the streets, or in general subjects that would arrest his own mind. Mineralogy was his especial delight and study at this early age; while other boys would spend their weekly holidays in play, he would start early, with a lunch in his pocket and a steel hammer in his hand, and spend the whole day with a companion in the 'quarries' north of the city, or in the 'deep cuts' of the iron district, or at the 'Bare Hills.' The boys at school were always interested in his specimens, and many a young mineralogist received his taste and first lessons from this young teacher. My mind is full of pleasant and affectionate memories of him, for he was one of the brightest, purest and best boys I ever knew.

"In 1831, while on a visit to his friend Joseph C. Turnpenny, in Philadelphia, he became interested in the drug business, and apprenticed himself to Henry M. Zollickoffer, at the corner of Sixth and Pine streets, where his friend Joseph C. Turnpenny was em-

* The historical information and other facts recorded in this Memorial were obtained from the files of the American Journal of Pharmacy, other journals, and from the members of Prof. Procter's family; personal reminiscences also form a part.

ployed. The two friends were soon fairly launched upon their life-work, and it must be remembered that apprenticeship in those days was a very different thing from the clerk hiring of to-day. William Procter as an apprentice was faithful, earnest and true, and there is little doubt that his mother's wise counsel and tender sympathies were largely instrumental in laying those most important foundation stones upon which the noble character was built. He endeared himself to his employer by the carefulness, brightness and alacrity with which he performed all his duties. At the age of nineteen, he lost his mother, which was a sad blow to him. He records in his diary the following: "I have indeed lost another and only parent, who has watched over me with truly parental care and tenderness. All my hopes of repaying her unceasing kindness are now at an end, and all my dreams of pleasure about the days when I should become a corner-stone to her have vanished forever."

He entered the Philadelphia College of Pharmacy, and his studies were ever marked by an intense earnestness and a determination to make himself proficient. He graduated in March, 1837, his thesis being upon "Lobelia Inflata." He demonstrated the presence of the liquid alkaloid "lobeline," and his research attracted at once much comment. In May, 1840, he was elected a member of the College, and from that time the American Journal of Pharmacy contained many contributions from his pen. During his apprenticeship with Mr. Zollickoffer, he found leisure to study carefully a number of chemical works, and he attended special lectures given by Drs. Hare, Mitchell and Bache in the winter of 1840. In 1841, we find him occupying the position of Secretary of the College Committee for the Revision of the United States Pharmacopœia. Later, in February, 1844, he purchased the property at the southwest corner of Lombard and Ninth streets, Philadelphia, and fitted it up as a drug store. A glimpse of his character may be afforded by the following extract from his diary written at this period: "I am about to leave Sixth and Pine streets after so long a residence. What singular events occur! Little did such a prospect appear probable some years ago. Steadiness and calmness of mind—how important to the proper appreciation of life! This I daily become more convinced of, and find cause to note the want of it in my own case. Reflection steadily and calmly directed to moral and intellectual improvement, with all the rigor of justice, and all the affection of mercy, how few can truly govern themselves! I have made little progress in this all-improving power, and have too frequent cause to regret acts of indiscretion and weakness."

On May 12, 1844, his store was opened and his trials began. He wrote in his diary three months after his store was opened, "It has been a time of singular discomfort to me. The anxiety attending the opening of a new store and the much time unemployed has been very burdensome. I need more faith and confidence in the course of events." The neighborhood of Ninth and Lombard streets would not have presented many attractive prospects to most beginners, particularly to one so well qualified as Mr. Procter for advanced work in pharmacy. The square on the south side of Pine street, between Eighth and Ninth, was an open lot, and the next street below was the boundary of the city proper, and beyond many lawless associations were in full force. Steadily and quietly, however, Mr. Procter made his way and "bided his time." He employed his leisure moments in devising new preparations, and, having a great love for individual investigation, there is no question that at this period of his life valuable seed was sown which gave a bent and direction to his future life from which the profession of pharmacy has derived such lasting benefit. Had he been launched directly upon a thriving and flourishing business career, it is quite possible that Mr. Procter would have closed his life richer in this world's goods, but it is doubtful whether he would have had the leisure to give so much self-sacrificing labor to the interests of his profession and to the lasting good of its followers. The neighborhood, however, gradually improved, the extension of the city made the erection of new houses necessary, and slowly but surely the business prospered.

William Procter's professional life-work, apart from his great desire to elevate pharmacy by every means in his power, was chiefly devoted to two objects: first, the upbuilding and development of the American Journal of Pharmacy; and second, the education and training of pharmacists, chiefly through his work as Professor in the Philadelphia College of Pharmacy. It must not be understood, however, that these two objects alone occupied his energies. The American Pharmaceutical Association, of which he was one of the founders, the revision of the United States Pharmacopœia, which is filled with many contributions from his active pen, and many other interests claimed his attention. A pen picture of William Procter at this time would have shown a young man of medium height, slender, with coal-black, straight hair, piercing black eyes, which were ready in a moment to sparkle with humor or flash with fire at the thought of injustice done to another; active in movement, solicitous for the welfare of others, modest and retiring in disposition, faithful in his obligations, yet withal morbidly sensitive to criticism; a charming companion to all who knew him intimately, even to playfulness at times, but such times were always when he was "off duty with his bow unstrung;" but even at this period of life, a close observer could not fail to realize that here was a man destined to make a mark which would outlast the eroding influences of time. Imbued with the deepest love for his profession and possessed of buoyant youth, he cast himself with enthusiasm into his pursuits, and, fortunately, having the gift of close observation, and above all a sincere love for truth, there remained but the contingency of limited physical powers to offset his career. Fortunately for pharmacy, the latter proved sufficient to sustain him through not what might be called a long life in years, but ample for a long line of achievements.

His journalistic labors began in 1846, when he was associated with Prof. Joseph Carson as co-editor of the "American Journal of Pharmacy." For two years previously he had assisted Prof. Carson in the editorial management. In 1850 Prof. Carson resigned his position, and Prof. Procter assumed sole editorial charge. In 1853 the "Journal" was enlarged by the issue of six numbers annually in place of four. In 1871 the issue of the "Journal" was made monthly. Prof. Procter inaugurated the monthly issue, and after editing the April number resigned his position, and was succeeded by Prof. John M. Maisch. He had contemplated a relinquishment of his editorial duties for some time, and in a written communication to the college some months previously, had advocated a monthly issue of the "Journal," and requested to be relieved from the editorship as early as the college could find a suitable successor.

For twenty years the "Journal" had been under his management in its editorial department, and how successfully that management was conducted, the volumes issued during that period are the best testimony. The original matter from his pen, and his judicious selections, gave to it a value and standing among American pharmacists, and made it the most complete history extant of the progress of pharmaceutical science in the United States. As an editor, he was just to all contributors, forbearing in criticism, never indulging in personal or sarcastic comments, ever ready to expose fraud and empiricism, loving truth, and sometimes proclaiming it when it was a disagreeable duty.

After resigning the editorship, his time was so much occupied by his business that his name does not appear as a direct contributor to the "Journal." In April, 1871, an article appeared from his pen on "Pharmaceutical Titles," the last of the long series. The General Index of the "Journal" exhibits seven columns, numbering some 550 items, under his name, exclusive of extracts and editorials. We think it may safely be said without disparagement to any of his predecessors in the editorial management of the "Journal," that the College was fortunate in placing the "Journal" in his hands. No man of the time could have been placed on the outlook commanding the horizon of pharmaceutical literature, whose heart was more thoroughly engaged in the work, and who was gifted with quicker perception or better judgment. His name will ever be associated with the progress of pharmacy in the United States, and the twenty volumes of

the "Journal" which bear his name as editor, remain a monument to his genius and zeal.

A complete review of the published essays of Prof. Procter would occupy too much space for this memoir, and we can only allude to a few of them. His thesis in 1837 on *Lobelia Inflata*, in which he demonstrates the presence in the plant of an alkaloid, describes the salt formed by union of the principal acids with the alkaloid, and proposes the name Lobelina for the active principle.

Three years previous, S. Calhoun, M. D., Professor of Materia Medica in Jefferson Medical College, Philadelphia, published in the American Journal of Pharmacy, Vol. V., the investigation of an acidified extract from Lobelia, which foreshadowed the presence of an alkaloid, but did not succeed in isolating the principle. Prof. Procter was aware of Dr. Calhoun's investigation, and refers to it in his supplementary paper, published in 1841—a "casual omission," as he states, in not having done so in his thesis. In November, 1850, Mr. William Bastick read a paper before the Pharmaceutical Society of Great Britain on *Lobelia inflata*. He refers to Dr. Calhoun's paper, but evidently was not aware of Prof. Procter's researches in 1837 and 1841. Mr. Bastick isolated the alkaloid, and describes it, and his name is associated in the books with its discovery. In January, 1851, Prof. Procter writes to the Editor of the Pharmaceutical Journal, London, as follows: "For some reason, these (my) essays appear to have been entirely overlooked by the press and writers on your side of the Atlantic, and now that the drug is attracting the attention of your medical men, its chemical relations are exciting the curiosity of your pharmaceutists. I should not have taken the trouble to bring their existence to your notice, had I not observed the paper of Mr. Bastick in your Journal for December, in which he states his ignorance of any previous researches having the same tendency as his own."

The Pharmaceutical Journal then published Prof. Procter's essay, placing him thirteen years in advance of Mr. Bastick as the discoverer of Lobelina.

In the same year with the publication of his thesis, we have "Remarks on an oil obtained by distillation from wild cherry bark, and evidences of its similarity to oil of bitter almonds."

In 1838, a paper "Demonstrating the existence of amygdalin in several species of the genera Prunus and Amygdalus."

In 1839, "Observations on dextrin and diastase," and "On Lobelia cardinalis," showing the presence in that plant of an alkaloid differing in some respects from the alkaloid found in Lobelia inflata.

In 1840, a paper "On the power of saccharine substances in protecting from decomposition solution of protiodide of iron."

In 1841, an essay "Supplementing his thesis on Lobelia inflata, and showing that the alkaloid therein described represents the plant in medicinal qualities."

In 1842, "Observations on the volatile oil of Gaultheria procumbens, proving it to be a hydracid analogous to salicylous acid."

A year later, M. August Cahours took up the same subject, and arrived at the same results by a proximate analysis of the oil, but in his paper, published in the Journal de Pharmacie et de Chimie, March, 1843, he makes no allusions to Mr. Procter's previous publication, leaving us uncertain whether he had seen Mr. Procter's paper, or whether the investigation made by him was coincident with that of Mr. Procter.

In 1843, "On the volatile oil of Betula lenta (sweet birch), and on Gaultherin"—a substance playing a part similar to amygdalin—and which, by its decomposition, yields an oil identical with oil of gaultheria.

In 1847, "On the reduction of oxide of iron by hydrogen."

In 1849, "Remarks on the oleo-resinous ethereal extracts, their preparation, and the advantages they offer to the medical practitioner."

In 1851, among numerous contributions, we have an essay "On the botanical and chemical character of sassy bark (the doom plant) of Western Africa."

In 1852, a continuation of the essay on sassy bark, and "Observations on the volatility and solubility of cantharidin, in view of an eligible pharmaceutical treatment of Spanish flies."

In 1853, fluid extracts began to attract attention, and in this and the succeeding year he contributed several papers on that subject; also one "On the pharmacy of the phosphates."

In 1859, "An essay on the hypophosphites."

In 1859, "On polygalic acid" and "On the existence of nicotina in green tobacco." In the same year he read before the American Pharmaceutical Association, in Boston, an elaborate essay on fluid extracts, suggesting formulæ for their preparation, and presented specimens of over thirty fluid extracts prepared according to his suggested formula.

For this essay a copy of Pereira's Materia Medica was voted to him by the Association as a testimony of its appreciation of his services. This paper may justly be considered as forming the basis on which many fluid extracts were admitted into the Pharmacopœia.

In 1866, we have an essay "On Liquidambar styraciflua and its balsamic resin," "showing the principle contained in the resin to be cinnamic acid."

William Procter, Jr., became a member of the Philadelphia College of Pharmacy in 1840; in the succeeding year he was elected to the Board of Trustees, and held that position during his life. In 1855, he was made Corresponding Secretary of the College, and continued to serve as such for twelve years. In 1867, he was elected First Vice-President of the College. His interest in the affairs of the College continued unabated during the thirty years of his connection with it; so closely was he identified with its progress that its history during that period is almost a narrative of his life.

He served on all committees appointed for the decennial revision of the Pharmacopœia for thirty years, and his services were engaged in assisting Doctors Wood and Bache in several of the later editions of the United States Dispensatory.

In 1872, the Chair of Pharmacy became vacant by occasion of the death of Prof. Edward Parrish. The season for the opening of the course of lectures was so near at hand that the Trustees of the College turned their minds instinctively towards William Procter, Jr., as the man to relieve them from embarrassment. The Trustees were well aware that he had an earnest desire for retirement, and canvassed well the field for one who could at so short a notice take up the course on practical pharmacy. At the request of the Board of Trustees of the College he consented to fill the chair, and delivered the course of lectures in the winter of 1872–73. It was known to his friends that the position was intended by him to be but temporary, and that he contemplated retiring at the close of the following session. The lectures for 1873–74 progressed as far as February 9th, and but a few more remained to finish up the work which he intended should terminate his professorship. On the evening of February 9th he delivered his usual lecture, and on returning home expressed the great satisfaction which the attention of the class had given. At a late hour he retired in apparent usual health; shortly after falling asleep a disturbance in respiration aroused the attention of members of the family, and before medical assistance could be called life had ceased.

Twenty-six years have elapsed since Professor Procter passed away. It is true that pharmacy has witnessed many changes in the last quarter of a century, but his work still remains. Methodical and careful in his habits, far-seeing in his vision, equipped by his experience in writing and teaching with the everyday needs of the pharmacist, no wonder need be expressed that time has made so few ravages, and very little of his work can be said now to be obsolete. He lived in what might well be termed the heyday of galenical pharmacy. He witnessed the birth of fluid extracts. Indeed, it is not too much

to say that he was the chief nurse of these infants, and while others came after and assisted in the nurture of the children, he was ever faithful, and he lived long enough to see them grow to lusty manhood. If he were but permitted to see the developments in this branch of the pharmaceutical art, what satisfaction and what comfort it would be!

In 1849 there was issued from the press his American edition of "Mohr and Redwood's Practical Pharmacy." This voluminous work was enriched by additions from his own pen. The work never went through a second edition, attributed in a great measure to the cost of proper illustration, which the publishers were not willing to incur, and without which much of the value of the work would have been lost.

In October, 1851, there was assembled in the city of New York a convention of pharmaceutists, in pursuance of a call made by the New York College of Pharmacy, for the purpose of considering the law relating to the inspection of drugs at the Custom Home, and to fix upon some standards which would enable inspectors to act with uniformity and discernment. The Philadelphia College of Pharmacy was represented by Chas. Ellis, Wm. Procter, Jr., and Alfred B. Taylor. This gathering of men of note called to discuss the customs law, was impressed with the advantages which would be derived by the pharmacists of the United States from a large association, national in character, where, by personal intercourse and exchange of experience, the practice of pharmacy throughout our widely-extended country would be more harmonized and the general standard of education elevated. It was therefore, "Resolved, that a convention be called, consisting of three delegates from each incorporated and unincorporated pharmaceutical college and society, to meet in Philadelphia on the first Wednesday in October, 1852."

This convention assembled in the old College building in Zane street (now Filbert street), and here was inaugurated the American Pharmaceutical Association, the President of the College, Daniel B. Smith, acting as its presiding officer. From the time of its inception William Procter, Jr., enlisted all his activity in promoting its welfare, and his name will be found in all its Proceedings down to the meeting in Richmond, Va., 1873.

In 1852, he was a member of its first Executive Committee; in 1853, was Chairman of a committee appointed to prepare an address to the pharmaceutists of the United States on the subject of pharmaceutical instruction.

In 1853, he was a member of the committee appointed to prepare a paper on the standard of quality for drugs, together with appropriate tests for detecting adulteration. This committee was continued until the year 1856.

In 1856, he was Chairman of the first committee on the progress of pharmacy, all previous reports on this subject having been made by him in his capacity of Corresponding Secretary. In the same year he was appointed Chairman to report a syllabus of a course of study appropriate to students in pharmacy. This Committee was continued until the year 1858, when he made the report published in the volume of Proceedings of the Association of that year. He was Corresponding Secretary from 1852 to 1857, First Vice-President in 1859–60, and was elected President at the session of the Association which convened in Philadelphia in 1862.

In 1866, he was appointed one of the delegates to represent the Association at the International Pharmaceutical Congress to assemble in Paris in the following year.

He was absent from the annual meetings of the Association but once (while in Europe), and contributed largely to the interest of its Proceedings by answers to queries which he had accepted, and by his volunteer papers.

The papers contributed by Prof. Procter to the American Pharmaceutical Association are numerous, and marked by his usual carefulness and accuracy of investigation. Of these, his essay "On Ergot" (suggesting the use of acetic acid in its preparation), "On Aconite root," "Atropia from American belladonna," "On extract of Cannabis Indica," "On Sassafras officinale," may be mentioned as not included in the preceding review.

In the Proceedings of the Association for 1873 will be found several able papers from his pen. One, "On suggestions to beginners in pharmacy," should receive attention from all of that class who purpose following in the path which he has trodden before them.

This sketch would be incomplete without some notice of Prof. Procter's home life, and it can be readily surmised that a man with his character and happy disposition would be calculated to make home happy, and that those who were drawn within the circle of his immediate influence became strongly attached to his personality.

Prof. Procter was married twice; first in October, 1849, to Margaretta, daughter of Amos and Elizabeth Bullock. Two children blessed this union, Wallace, born in 1851, and Mary Goldsmith, in 1852. Wallace Procter followed in his father's footsteps, and now conducts a pharmacy in Philadelphia. He has been a trustee of the College for a number of years, and is widely respected for his sterling worth, and has given a long service to the interests of the Philadelphia College of Pharmacy.

In 1864 Prof. Procter married Catherine, daughter of Robert and Sallie Parry. This honored and beloved woman is well known to many of the older members of this Association. She nearly always accompanied her distinguished husband to the meetings of the Association, and her bright face and gentle manners endeared her to all who enjoyed the pleasure of her acquaintance. It would have been a great satisfaction if she could have been here at this meeting. It is just twenty-seven years since Prof. Procter attended the last meeting of the American Pharmaceutical Association, held in the City of Richmond in 1873. The loss of her dear husband was, of course, a sad blow to her. In conversation with her a few days ago, she enjoyed with much interest hearing from many of her old friends who still are members of this Association; and I am sure that every member will join in the wish that her future years may be filled with happiness.

In concluding this brief tribute to the memory of William Procter, a few extracts from a eulogy delivered at a meeting of his sorrowing colleagues, students and friends may not be inappropriate:

"How sad for us to think we shall never hear his voice again, that we were not permitted to be with him when he breathed his last, that we could not hear the final message from his lips as the dim future opened before him. No answering pressure of his hand, no parting token of his love; for so sudden was the summons that he stopped not at the river, his feet scarce touched the chill depths of the mysterious stream, when he was fairly over.

"It was not the quiet swinging of the pearly gates as they opened to admit one more among the countless throng, but a sudden flash, and wide open sprang those doors as his spirit passed through.

"Yet, my colleagues, there was mercy in the hand which laid him low; no sharp death agony, no long and painful struggle, and no wasting fever racked his frame; a mere transition; a simple laying down of life and taking up a new.

"How appropriate are the words of the famous Carlyle: 'The man whom we love lies there, but gloriously worthy; and his spirit yet lives in us with authentic life. Could each here vow to do his little task as the departed did his great one—in the manner of a true man—not for a day but for eternity; to live as he counseled, not commodiously in the Reputable, the Plausible, the Half, but resolutely in the Whole, the Good, and the True.'"

The reading of the memorial was received with prolonged applause, and evidence of deep appreciation on the part of those present.

THE PRESIDENT: I am sure this Association receives most gratefully the presentation

of this memorial, which is at once the due of one of the founders of pharmacy in this country, and likewise due as a memento of the previous meeting in the city of Richmond. Personally, I remember William Procter, Jr., very gratefully indeed. I knew him for years in his editorial capacity on the American Journal of Pharmacy. I met him at a few of our meetings, and he impressed me very strongly as a man of wide and exact scientific and professional knowledge, of most genial heart and most happy disposition. I regret that the limited time of our order of business this morning will not permit us to hear as much as we should like to hear from some of the colleagues and co-workers of Mr. Procter; but if any one of his friends has a word to say, we shall be glad to hear him, I am sure.

MR. ALPERS: I had not the privilege of knowing William Procter, but what I have heard of him and what I have read of him convinces me that he was one of the shining stars of pharmacy. I have always thought of him as one of the greatest men in pharmacy this country has ever produced, and after hearing the memorial that Mr. Remington has read, I am sure my opinion has not been an incorrect one. To me, the reading of the lives of the great men who have lived before us has always been an inspiring theme. I have often turned from the turmoils of business to some book of history, to some book of literature, and spent half an hour of delightful recreation in such company. I am happy that of the great Americans whose lives have been valuable to us, that of William Procter is one, and I hope what we have heard here this morning will be repeated in our colleges, and that our young men will be told about Prof. Procter, and taught to imitate and emulate this shining mark in pharmacy. Unfortunatetly, we are too much in the habit of considering those the great men of history who stand before us in glittering armor—the men who have led battles, won cities and founded new empires. But these are not the men who lead civilization. Those men are the men who, in the quiet of the study or the retreat of the laboratory, think out new schemes to benefit mankind. Such a man was William Procter. He may be compared to a small flower, but a flower of great value, which grows and blooms unknown to the great masses, choked by high weeds and unseen of men, and over which the heedless walk in sheer carelessness. It is left for the lover of truth to bend back the weeds and discover the small, useful flower, and in the discovery we gain new confidence in the higher vocation of mankind. Such a flower was William Procter.

MR. HYNSON: I will not presume to remark upon this subject, but I want to say that we have with us to-day a gentlemen who was elected President at the meeting referred to in Richmond 27 years ago, and I would like to introduce Mr. John F. Hancock to the Association, that he may give us some personal recollections of Prof. Procter.

MR. HANCOCK: This is an unexpected honor to be introdueed to this assembly, but it is an honor that I appreciate very much. I am sorry I was not present to hear the entire paper read by Mr. Remington, because he dilated upon a subject that, of all others, is most precious to my heart, for the reason that I knew Prof. Procter very intimately. You know the Baltimore pharmacists claim Prof. Procter, as well as the pharmacists of Philadelphia; but, as a matter of fact, he should not be claimed by the Baltimore or Philadelphia pharmacists alone, but by the entire profession in the United States, and not the United States alone, but by the entire world. He was cosmopolitan. He was the embodiment of truth, the essence of honor, a man and a gentleman, and a qualified pharmacist, in the fullest sense of those terms. There is no name in the list of pharmacists that I feel deserves so much the veneration of pharmacists as the name of William Procter, Jr., and it is a pleasure to pronounce my few feeble words in honor and praise of that distinguished pharmacist of the past.

MR. EBERT: I would make a motion that the thanks of this Association be extended to Mr. Remington for this memorial. And in connection with that I wish to say, that Prof. Procter was one of my dearest friends, from 1863 to his death. I had the pleasnre of being one of his pupils, and likewise the pleasure of his companionship during the sessions of the American Pharmaceutical Association constantly. I also had the pleasure of traveling with him in Europe. While in Europe he was suffering with heart disease, but he was so courageous that in traveling in Switzerland even nothing would discourage him, and he insisted on getting on top of the highest mountains. I remember one occasion particularly when were ascending the Wenger Alps. We had started early in the morning, and had ascended some three thousand feet when Prof. Procter collapsed. I was behind him—there were four of us in the party—and for half an hour we thought he would surely die. We used the limited restoratives we had, and after he recovered a little he pressed his hand to his heart, and when he could speak he said: "I have heart trouble; I ought not to have made this ascent." That was the first we knew of this trouble.

Now, to relate a little incident showing the humorous side of his nature: As the memorial states, he was an apprentice to Mr. Zollickoffer, of Philadelphia, and lived in his family for some years. They were a Swiss family, and he had become familiar with their early history in Switzerland, where they had a large estate. As we were about to leave Switzerland, going from Zurich, he called especial attention to the fact that he wished to go to the city of Basle to visit the old estate of the Zollickoffer family. As we entered the city, and had walked a short distance, the Professor said to me—as I was the only one who could speak the German language—"Albert, just ask some one where we can find the Zollickoffer estate; we don't want to be walking about all day. Ask that gentleman there," he said. I approached the gentleman and asked him if he could give us any information where we could find the Zollickoffer estate. He said, "I will show you." We walked four or five blocks, and then he said: "You see that second house across the street there? That is the home of the Zollickoffer family." Inthe mean time we had all gathered around this gentleman, and I said, "Thank you"—that is, I said, "*Danke, danke.*" Prof. Procter allowed the gentleman to go, and then he said in a very serious tone, "Albert, I thought thee was a gentleman." I said, "What's the matter now, Professor?" "What's the matter now?" he said. "After a gentleman has taken the trouble to go all this way to show us the Zollickoffer estate, you call him a *donkey!*" [Laughter.] I said, "Professor, I didn't call him a donkey; I said "*danke.*" "What is a danke?" I said, "Thank you, in German." "Well," he said, "if that's the language they have here—if that's their word for 'thank you —I don't want any of it" [Laughter.]

Mr. Ebert's motion for a vote of thanks to Mr. Remington was seconded by Mr. C. W. Holmes, and carried unanimously.

On motion of C. W. Holmes, duly seconded, it was agreed to publish the memorial of Wm. Procter, Jr., in separate form, the exact style of publication to be left to the judgment of the Council.

THE PRESIDENT: I am glad to see that we have with us a delegation from an affiliative body in sympathy with the American Pharmaceutical Association, and the limited time that the persons forming the delegation have to be with us requires that they should be heard at this session. The National Wholesale Druggists' Association, over the signature of its President, Mr. E. C. Frisbie, certifies that the following members have been appointed delegates to the annual meeting of this Association to be held in Richmond, May 7–12, viz.: Jno. B. Purcell, of Richmond; Geo. A. Kelley, of Pittsburg; C. F.

Shoemaker, of Philadelphia; Wm. J. Schieffelin, of New York. These are all well known names. Col. Purcell, of Richmond, the chairman of this delegation, will please come forward and greet the members of this Association.

Col. Purcell came forward and said:

Mr. President and Gentlemen of the American Pharmaceutical Association: It is indeed a pleasure to me to appear before you to convey to you the greetings of an association whose every interest, whose every impulse, is one to further the interests of this Association. The labors of our Association cannot but redound to the interest of yours, and I am commissioned by the President of the N. W. D. A. to assure you that at all times, and in all seasons, we stand ready to extend the right hand of fellowship to you, and to accord to you every assistance in our power to forward your interests along with our own. As an earnest of this, we are now striving to master and settle one of the evils which has made great inroads into the business of your members, and I am pleased to be able to say that I have it from Mr. Holliday, the representative of your interests, that we are meeting with that success which I am satisfied will find a response on your part that will repay us for every effort we have made in this direction. And now, Mr. President and gentlemen, again assuring you of the interest of the N. W. D. A. in the work of this Association, I invite you, on behalf of my Association, not only to appoint delegates to our meeting, but insist that they shall come. We promise you our hearty co-operation, and promise your committee a good time when we shall meet in Chicago in September. I trust that your stay in this my native city will be a pleasant one, and that you may carry away with you many happy memories; that you will come back in less than 27 years next time, and that you will bring back with you—as Prof. Diehl was telling me last night he did of the meeting in 1873—the most pleasant recollections of this meeting. Gentlemen, I thank you for your attention.

THE PRESIDENT: I am sure this Association returns hearty greetings in response to the greetings of the N. W. D. A., and extends thanks for this warm invitation for the attendance of a delegation from this body. We hope that these delegates may continue with us as long as possible, and especially we shall be glad to see them in the sessions of the Section on Commercial Interests, so soon to open, where we feel that their counsel will be of value to us. Are there delegates from other bodies present?

MR. HYNSON: Mr. Holliday is here from the National Association of Retail Druggists. He is Chairman of the Executive Committee of that Association.

THE PRESIDENT: We shall be glad to hear from Mr. Holliday now.

Mr. Holliday came forward and said:

Mr. President and Gentlemen of the American Pharmaceutical Association: I have become so thoroughly imbued with the spirit of the working side of pharmacy—so absolutely absorbed in the commercial interests of the pharmacist — that I do not expect to say anything at this session of the Association, but will be ready to say something at the meeting of the Commercial Section, which I believe meets this afternoon to hear what the Executive Committee of the National Association of Retail Druggists are doing, and trying to do. The Chairman of the delegation, Mr. W. C. Anderson, has not reached here. I had expected him to respond to your word of greeting to our delegation. I thank you, though, for the recognition of our Association, and shall be glad to tell, at the meeting of the Section referred to, of our work. [Applause.]

The President called for delegates from other Associations, but there were no responses.

The Chair called for the reading of Minutes of the Council, and Mr. Kennedy read the Minutes of the second session, held at Richmond, as follows:

FIFTH SESSION OF THE COUNCIL—MAY 8, 1900.

The meeting of the Council was called to order at 9.30 a. m., by Chairman Thompson, the following members being present: Messrs. Caspari, Ryan, Hopp, Kennedy, Prescott, Payne and Sheppard.

On motion of F. G. Ryan, the reading of the minutes of the fourth session was dispensed with, having already been approved by the Association.

The Secretary, G. W. Kennedy, presented the names of twenty-two applicants for membership in the Association, and the Chair directed that they be referred for action to the Association at large.

On motion of Chas. Caspari, Jr., seconded by G. W. Kennedy, Chas. W. Hancock, of Langhorne, Pa., was granted permission to withdraw his resignation and be re-instated as a member.

On motion, Council adjourned.

GEO. W. KENNEDY, *Secretary.*

On motion of Mr. Whelpley, the minutes were adopted as read.

The Chair announced that the next order of business was the presentation from the Council of a list of new names approved for membership.

Mr. Kennedy, Secretary of the Council, thereupon read a list of 99 names proposed for membership, and they were ordered posted for inspection, under the rule.

On motion of Mr. Sheppard, seconded by Mr. Lyons, it was ordered that when this session adjourns at 12 o'clock to give the members an opportunity to take the carriage drive about the city, arranged for by the Committee on Entertainment, it be to take a recess only, until 3 p. m., in order to finish up the regular business of the second session.

The President announced that the Secretary would now call for reports from the various standing and special committees, to be read and acted upon.

The Secretary called for the report of the Committee on Transportation, which was ordered passed for the time being.

The Secretary said that Mr. Eliel, Chairman of the Committee on Revision of the United States Pharmacopœia, not being able to attend the meeting, had sent the report of the committee to him, with request that he turn it over to the members of the committee who might be present, but that he had been unable to find any of the members, and that the report was in his hands subject to the action of the Association. On motion of Mr. Kennedy, the report was referred to the Scientific Section.

The report of the Committee on General Prizes, Mr. Searby, Chairman, was not quite ready, and was passed.

The report of the Committee on National Legislation, Mr. Stewart, Chairman, was called for, and Mr. Oldberg moved to refer to the Section on Education and Legislation.

MR. EBERT: I think it is absolutely necessary that we should understand this Report. I do not understand it, and I am one of the committeemen. I do not know what the Chairman means by any such recommendation as he has in that report.

MR. GOOD: The reference seems to me entirely appropriate. The time for general session work is exceedingly limited, and the reading of the paper and its discussion may be just as well had in the Section as at any other time or place. Furthermore, any official action that may be taken can be referred to the General Association. The time is available there, and not here, and I think the reference will be appropriate.

MR. EBERT: It is so important that it affects every one of us, and if this is going to be endorsed by the Section on Education and Legislation it is a serious matter.

The motion to refer was put and carried.

The report of the Committee on National Formulary was next called for, and Mr. Diehl, Chairman, presented the report as follows:

REPORT OF THE COMMITTEE ON NATIONAL FORMULARY.

To the American Pharmaceutical Association: The Committee on National Formulary have the pleasure to report that, after various delays beyond the control of the Committee, the "Epitome" is about ready for distribution, and that copies are promised by the printer and binder in time for this meeting or before final adjournment. The terms under which this work has been done are such that the little volume can be supplied at prices so reasonable, that its circulation among the physicians of our country by pharmaceutical bodies and individuals would seem to be assured. It is suggested in this connection that an adequate number of copies be presented to the section of Materia Medica, Pharmacy and Therapeutics of the American Medical Association in time for distribution to the members of that Association in attendance at its coming meeting at Atlantic City, this Committee being clearly of the opinion that such a course will prove an excellent means of directing the attention of physicians throughout our land to the importance of the work.

The Chairman of the Committee reports that his various duties have prevented compliance with the resolution passed at the last annual meeting, under which the Committee was instructed to prepare a supplement to the National Formulary. The Association will perhaps agree with the Chairman, however, that an issue of a supplement at this time would be unwise in view of the fact that a complete revision will become necessary as soon as the revision of the U. S. Pharmacopœia is completed, an event which may be confidently expected within the next two years. Moreover, a supplement following so closely upon the issue of the "Epitome" would be likely to cause confusion and in other ways react unfavorably upon its reception by the medical profession. It is suggested that a complete revision of the "Formulary" be ordered to closely follow the revision of the U. S. Pharmacopœia, and that for this purpose the incoming standing committee be augmented by ten auxiliary members, such to be selected by the Chairman of the Committee from members residing in different sections of the United States.

Respectfully submitted, C. LEWIS DIEHL, *Chairman.*

THE PRESIDENT: Gentlemen, you have heard this important report of the Committee on National Formulary, embodying important recommendations. What will you do with it?

On motion of Mr. Oldberg, seconded by Mr. Good, the report was ordered received and the recommendations approved.

The report of the Committee on Weights and Measures was called for, and Mr. Ryan, Chairman, read it as follows:

REPORT OF THE SPECIAL COMMITTEE ON WEIGHTS AND MEASURES, AMERICAN PHARMACEUTICAL ASSOCIATION.

Gentlemen: The Special Committee on Weights and Measures is pleased to submit the following report:

Although much less than one year has passed since our last meeting, new evidence has developed of the growing interest in the legal adoption of the Metric System of Weights and Measures in this country.

Two bills have been prepared and presented to Congress having this end in view, and are now being considered by the Committee on Coinage, Weights and Measures of the House of Representatives. Your Chairman has endeavored to secure a hearing for our Committee, and has had considerable correspondence with Hon. James H. Southard, the Chairman of the House Committee, but as it is not probable that action can be secured at this session of Congress, it was thought best to postpone the hearing until a later date.

The International Commercial Congress held in Philadelphia last fall, and attended by representatives of fifty-five foreign countries, furnished an opportunity for discussion of the subject. In an address before this body, J. H. Gore (Washington, D. C.), (see Proceedings of the International Commercial Congress, Philadelphia, page 172), forcibly urged the adoption of the Metric System in the commerce of the United States. Quoting Mr. Furbush, formerly Director of the Bureau of American Republics, Prof. Gore says, "The failure of the United States Government to adopt the Metric System is one of the most inexplicable instances of false conservatism in the history of the country. In face of the fact that almost every civilized country has seen the necessity of a common system of weights and measures to facilitate the exchange of commodities, the people of the United States have persisted in retaining their old and cumbrous system, which might have served those who believed in non-intercourse with the outside world, but which stands as a barrier to that freedom of exchange to which the whole world is now tending. We send consular representatives to every quarter of the globe for the express purpose of making possible an extension of our foreign commerce, and then busy ourselves in an attempt to make such foreign commerce possible, and retain a system of weights and measures which add to our own difficulties, and make us mere barbarians to the more progressive nations."

During the past year, the Council of State of the Russian government has approved a scheme for the adoption of the Metric System. This country has already adopted the Metric System in its Customs Service, and the commercial use of the same in the near future is probable.

With the Consuls of the United States and Great Britain constantly urging their respective governments to consider favorably this subject, and with the influence which is being brought to bear by many scientific bodies in both countries, it does not seem possible for the legislative branches of the United States and Great Britain to much longer resist the force of this important factor in the progress of the Commerce of Nations.

During the coming year our Committee and members of this Association will undoubtedly be called upon to use their influence with members of Congress to secure, if possible, favorable consideration of the bills bearing upon this subject.

Respectfully submitted, F. G. RYAN, *Chairman*.

MR. RYAN: I would like to say for the benefit of those members of the committee who may possibly think the committee is a dead one because they have not heard from the Chairman, that this is not the case. The Chairman has been doing a great deal of

work, but it has not been practicable for him to communicate with the members of the committee individually, covering all the States and Territories, about the work that has been going on; but he will communicate with them at the proper time, and they will get all the work they want to do.

Mr. Lowe moved to receive the report and refer for publication. Carried.

Mr. Whelpley, Chairman, made the report of the Auxiliary Committee on Membership as follows:

REPORT OF THE AUXILIARY COMMITTEE ON MEMBERSHIP.

The fact that scarcely more than half a year has passed since our last annual report accounts, in a measure at least, for the rather small list of applicants for membership which we have to submit. This committee consists of sixty-nine members representing the various states, territories, the provinces of Canada and larger cities of the United States, also the Army and the Navy. In mapping out the work we have included the officers of the Association in our correspondence, thus making about one hundred persons whose energies have been solicited for the purpose of increasing the membership.

We have ever kept in view and urged the members to bear in mind that what we need is desirable members, parties who will appreciate affiliation and contribute to the professional standing as well as numerical strength of the Association. In order to secure such applicants we have relied upon the individual acquaintanceship of members of the committee and the officers of the Association.

We thought that it would be possible to average one application from each person soliciting new members, While some have forwarded four or more applications, a large proportion have failed to secure a name. The excuses are various. Some members of the committee, I regret to say, are in exceedingly poor health, and others plead that they are too busy, while a surprisingly large proportion failed to answer the various communications from the chairman of the committee.

We suggest that in case this committee is continued for another year, that the General Secretary be instructed to obtain a written acceptance from each member of the committee before the appointments are confirmed.

It is interesting to know that as far as observed, more pharmacists desire to join our Association on account of the practical value obtained from the annual volumes of Proceedings than for any other one reason.

In conclusion, permit me to most heartily acknowledge the ready co-operation of many members of the committee, and assure the Association that it is under deep obligations to those members and officers who have devoted much time and attention to the important subject of increasing and extending our membership.

Respectfully submitted, H. M. WHELPLEY, *Chairman.*

Mr. Lowe moved to receive the report, and that the thanks of the Association be tendered the chairman of the committee for his energetic work.

Mr. Dohme seconded the motion.

THE PRESIDENT: It will be understood, of course, that the filling out of this committee by the placing of a member from each State and Territory on it involves the appointment of members in the far West and the Territories where we have very few members indeed, so that what has been said regarding the indifference of some of the members is partly explained by the fact that we have had to select without any evidence of particular interest on the part of the scattered members in different places.

Mr. Lowe's motion was put and carried.

The Secretary stated that the next report would that of the regular Committee on Membership, by the Secretary, G. W. Kennedy:

Mr. Kennedy read the report as follows:

REPORT OF THE COMMITTEE ON MEMBERSHIP.

To the Chairman and Members of the Council of the American Pharmaceutical Association:

Gentlemen: Your Secretary takes great pleasure in submitting to you his twenty-sixth annual report in conformity with the requirements of the Association. Immediately after the adjournment of the last meeting, held at Put in-Bay, Ohio, the regular duties of his office were promptly attended to and the customary invitation was sent to each applicant who was invited by the Association to complete his membership. Fifty-nine gentlemen were recommended as competent persons to become members, and of this number fifty-seven, or ninety-four per cent. complied with the requirements, and their names placed on the roll of membership. Another member who had tendered his resignation to the Association last year was permitted by action of the Council to withdraw his resignation. While the number of applicants for membership does not appear quite as large as previous years, yet it is gratifying to know that such a large percentage conformed with all the requirements of the Association, whereas heretofore, while the number proposed was much larger, but only a small percentage manifested a deeper interest than to merely sign the blank application. What the Association wants are members who will interest themselves in its cause and make it ever to be honored and respected throughout the civilized world. The new members are credited to twenty-one States and the District of Columbia.

The good work done by the Special Auxiliary Committee and the regular standing Committee on Membership deserves special commendation. They have labored hard during the past year to procure worthy members, and according to present indications the increase will be larger than it has been during the past several years.

The Treasurer, S. A. D. Sheppard, reported to your Secretary that there were, on April 14, 1900, one hundred and fifty-two members liable to be dropped from the roll for non-payment of dues. There is no excuse to offer for such a large number of members becoming derelict in this duty. The depressed financial condition of the country has gradually passed away, and, I dare say, there are but few pharmacists in the United States, particularly those who are or have been members of our Association, who cannot afford to keep in good standing. All who have the slightest regard for their chosen profession, and have had the honor of having a membership in this organization bestowed upon them, should remain united and labor indefatigably in the common cause of raising it to the most honored profession within the reach of man. Let us hope that the next report will show a much smaller number, if any at all.

Report on Membership.

Active or contributing members in good standing at last report	1,230	
Members elected since last report	57	
Members elected by action of Council	1	
Total		1,288
Loss in Membership (active).		
By resignation	29	
By transfer to life membership	12	
By death	7	
Dropped from roll for various reasons	85	
Total		133
Number on roll at this report		1,155

Life Membership.

Number on roll at last report	97	
Number added since last report	15	
Total	112	
Loss in Life Membership.		
By death	4	
Number on roll at this report		108

Honorary Membership.

Number on roll at last report	11	
Additions	3	
Total	14	
Loss by death	2	
Number on roll at this report		12

Total Membership.

Active and contributing members	1,155
Life members	108
Honorary members	12
Total	1,276

And now, gentlemen, with a sorrowing heart I stop to pay a word of tribute to the memory of our esteemed associates who have joined the great number in the sleep that knows no awakening. Although the time has been short since our last mortuary record was presented, the grim Reaper has not been idle. Like a thief in the night who knows no mercy, he has entered the homes of many of our worthy members and cut them down irrespective of age or person. Of those who yielded to his unerring blow, some were in the prime of manhood, enjoying the fruits of that profession which they had for so many years earnestly labored to attain, while others, having reached the allotted three score years and ten, and after many years of thrift and usefulness had retired from the activities of life, stood ready awaiting Death's impetuous command. Peaceful sleep now crowns their brow, and though their bodies lie mouldering in the grave, their noble service to humanity will never die. True to their God, their neighbor and themselves, their lives will ever continue to shine as a light to all men, showing that the commercial and spiritual spheres of life can be observed in unison, and that after life's duties are o'er, one can enter upon that promised reward and there enjoy everlasting rest.

Among those of our number that Death hath claimed since our last meeting are found the names of Israel J. Grahame, John Buck, Alexander Hudnut and Charles Bullock, four of the Association's oldest members, men who far back in the 50's recognized not only the pleasure experienced by the prominent members of the profession meeting each other socially every year, but also the wisdom and benefits derived by their associating themselves together to elevate the status of the profession. Well have they shown the good derived by being a member throughout their lives, for each of them we find was firm in his principles, honest in his business, ardent in his desire to raise the status of the profession he loved and honored throughout the length and breadth of the entire country. The last-named gentleman also served the Association as its President during the year of 1870, and, as its supreme head, conducted its affairs very successfully. His commanding appearance, quick wit, and pleasing disposition won for him the respect and admiration of all the members, and his administration of that high office will not soon be forgotten.

But to all our departed associates, we can but bid farewell. Death marked them for its victims, and the grave now holds all that was mortal of their noble selves; that which is immortal is not confined within its cold and clammy walls, but has flown to where peace and happiness reign forever. Owing to the uncertainty of this transitory life, we know not who will be called from our midst next; but let us always remember and take consolation in the promise of our Creator so beautifully expressed in the lines of the poet:

"Art is long and time is fleeting,
And the grave is not its goal,
Dust thou art, to dust returneth
Was not spoken of the soul."

The following is a list of deceased members brought to the knowledge of your Secretary:

Charles Bullock, Philadelphia, Pa.
John Buck, Chelsea, Mass.
Fred H. Chapin, Hartford, Conn.
Israel J. Grahame, Philadelphia, Pa.
Thomas Greenish (Honorary), London, Eng.
John H. Hancock, Baltimore, Md.
Alexander Hudnut, New York, N. Y.
Hugh N. Osgood, Norwich, Conn.
T. H. S. Pennington, Saratoga, N. Y.
Gustave Planchon (Honorary), Paris, France.
T. D. Reed, Montreal, Can.
Peter Robertson, Newberry, S. C.
Eugene J. Russell, Baltimore, Md.
Frank M. Wilson, Willimantic, Conn.

Charles Bullock, President of the Philadelphia College of Pharmacy, died at his home 1017 Clinton street, Philadelphia, March 21st, from pneumonia. He had been ill for about five weeks. A son, William A. Bullock, survives. Mr. Bullock was senior member of the drug firm of Bullock & Crenshaw, on Arch street. He was born at Wilmington, Delaware, February 25, 1826. His father, John Bullock, a prominent member of the Society of Friends, was principal of a boarding-school for boys at Wilmington, which acquired a wide reputation, not only in the United States, but in the West Indies and South America. Charles Bullock at an early age showed a fondness for experimental science. His mother was the only sister of the late John Griscom, LL.D., of New York. From his uncle Charles Bullock received his first attraction to the department of sciences, which determined his choice of business life. At the age of fifteen years he entered Haverford College, where he remained two years. In 1844 he was taken into the store of Smith & Hodgson, at Sixth and Arch streets. While engaged at this store Mr. Bullock matriculated at the Philadelphia College of Pharmacy, and graduated in the class of 1847. Smith & Hodgson decided, in 1848, to give up their store and devote their attention to chemical manufacturing, and they erected a large laboratory on Gray's Ferry road. In January, 1849, Charles Bullock and Edmund A. Crenshaw succeeded Smith & Hodgson. The business of chemistry in its application to the arts increased so rapidly that Charles Bullock visited Europe in 1851, and here he secured much valuable information. In 1868 the business of the firm had grown to such proportions that it was removed to 528 Arch street, where the business is still carried on. In 1849 Mr. Bullock became a member of the Philadelphia College of Pharmacy, and a few years afterwards he was elected a trustee. He always took an active interest in the affairs of the College, and for a number of years he was Recording Secretary and a member of its Committee on Publication. He was also a member of the committee that selected the present location of the College, and for a number of years was Vice-President of the College, and on the death of Dilwyn Parrish, in 1886, he was chosen President. He was also Vice-President of Franklin Institute and a member of the American Philosophical Society and the Academy of Natural Sciences. He became a member of our Association in 1857 at the meeting held in Philadelphia in that year, and became Recording Secretary of the Association for the year 1859–60 and was elected President in 1876. He has been ac-

tively engaged in business as a druggist, apothecary and manufacturer for over fifty-six years. Mr. Bullock was rather quiet and reticent, and his prominence in pharmaceutical affairs is due to his sterling worth and his indefatigable labors for the cause of pharmacy rather than to any merely social qualities.

John Buck, one of the oldest and most respected residents of Chelsea, and one of the oldest pharmacists in New England, died at his home on County Road after a brief illness. Deceased was born in Malden, July 11th, 1819, and was a son of the late Dr. Ephraim Buck of Malden, and later of Boston. He was educated in the public schools of Malden, and was graduated at Warren Academy, Woburn. He served as apprentice to Seth Fowle, and in 1841 he started in the drug business for himself in Chelsea. His first store was on Winnisimmet street, near Park street. Some eighteen years afterwards he moved to Broadway and Congress avenue, which site was bought by the Chelsea Savings Bank. He retired from business about three years ago. Through his courtesy and honest principles of business, he acquired a large patronage, which clung to him throughout his entire business life. He conducted one of the largest drug stores in the city, and was highly honored and respected by all his acquaintances. The news of his death cast a gloom over the entire community, which was evidenced by the large number of mourners which attended his funeral. He was the oldest Odd Fellow in Chelsea, having been a member of Winnisimmet Lodge and a charter member of Mystic Lodge of that order. He was also a member of Old Washington Hose Company, Company 2, of the fire department, and a member of the Chelsea Veteran Firemen's Association. For a number of years he served as a member of the Common Council, and during that period favored every measure which tended to the advancement of that city. He was kind and charitable, and the poor and needy always found in him a faithful friend. Deceased became a member of our Association at the meeting held in the city of New York, N. Y., in 1855, and was one of its oldest members.

Frederick H. Chapin, of Hartford, Conn., died at his home in that city on January 25th, 1900, after a long illness. Deceased was born in Lafayette, Ind., in September, 1852. His parents, who were of Yankee stock, had but recently moved to the West, and a few years later they moved further west, settling at Fort Leavenworth, Kan. It was in the days before the railroads had reached the Kansas border, and the fort was one of the important terminals of the Santa Fe train. The boy spent much of his time around the barracks, and was much interested in the soldiers and army equipments. He loved the prairies, and watched the Indians on the neighboring reservations with much interest, when, at the age of ten years, he learned to ride horseback, and would frequently accompany the caravans for many miles out on the prairies. It was thus that Mr. Chapin acquired a love of adventure, travel and discovery, which influenced the rest of his life. Upon the death of his mother, when yet a young boy, he came to Hartford to live in the family of his aunt, Mrs. Thomas Sisson. He attended the district school, and at the age of fifteen entered his uncle's employ, the firm name at the time being Sisson & Butler. In 1881, he became a member of the firm. He was always fond of reading and study, his inclination leading him rather to scientific knowledge and to works on travel and adventure. Mr. Chapin became much of a traveler, being especially interested in mountaineering. He made a number of trips to the Rockies, but also found pleasure in the lower peaks of the White Mountains and the Adirondacks, and even the hills of Connecticut, where was the home of his grandfather, David Hastings. He also took two trips abroad, spending most of his time in the high Alps of Switzerland. Mr. Chapin also developed a great interest in the cliff-dwellings of the Southwest, and made a considerable investigation into this matter. Although disclaiming any pretense to being a collector, he made interesting collections from these ruins. He published two books on the West, one on mountaineering and one on the cliff-dwellers, which were flatteringly received and commended by authorities. He lectured several times before the

Academy of Sciences, New York, the Brooklyn Institute, the Cooper Institute, and numerous clubs and scientific societies. The last extended journey taken by Mr. Chapin was in 1894, when he made a visit to the Himalayas in India. On returning from the mountains to Calcutta, he continued his journey eastward, and returned home by way of the Pacific Ocean. After that he lived a quiet life, spending as much of his time as possible at the bungalow he had built for himself in West Hartford, employing his leisure time with his horses and other pleasures of a similar nature. In November, 1898, he was married to Miss Mary H. Potter, of Lafayette, Ind., who with one child survives him. It is said of him that he was shy and gentle, but yet he knew no fear. Even when he realized that his own struggle for life was hopeless, he was calm and cheerful, thoughtful to the end for others, and keenly interested in the affairs of the world of which he had seen so much. Mr. Chapin became a member of our Association at the meeting held at Saratoga, N. Y., in 1880.

Israel J. Grahame, one of the oldest pharmacists in Philadelphia, died at his home on Cresheim Road, Mount Airy, on the 25th day of November, 1899, aged eighty years. Mr. Grahame was born in Baltimore, and was a son of George Grahame, an active member of the Hicksite branch of the Society of Friends. He received a thorough education in the public schools and, after serving an apprenticeship with one of the most respected druggists of Baltimore, he became finally professor of pharmacy in the Maryland College of Pharmacy (1856), which position he filled most acceptably for a number of years. Deceased was at one time Principal of the Bellevue Institute for Girls at Attleboro, now called Langhorne, and Principal of the Sharon Seminary, at Sharon Hill. He subsequently engaged in the drug business, and later came to Philadelphia, where he started a drug store at Twelfth and Filbert Streets. After conducting the business for a number of years, he retired in favor of his son, George H. Grahame, who continued the business at that place until the building was torn down to make way for the Reading Terminal, after which it was removed to 28 North Twelfth Street. For the last twenty years of his life Mr. Grahame was an invalid, paralysis having deprived him of his power of speech, but his other faculties remained sound up to the time of his death. A widow, two daughters and a son survive him. Deceased was an industrious worker, charitable and courteous to all his customers. His always pleasant humor won for him a large number of patrons, and crowned his business life with success. He was upright and honest in all his transactions, and was highly esteemed and loved by all who knew him. His funeral was largely attended, and interment was made in Fairhill cemetery. Mr. Grahame united himself with our Association in 1856, at a meeting held in Baltimore, Md., and was one of its oldest members.

Thomas Greenish, an honorary member of our Association, and former President of the British Pharmaceutical Society, died at his residence in Dorset Square, London, on September 28th, in his eighty-second year. Mr. Greenish was the oldest member of the Pharmaceutical Society, having joined it as an associate in 1841. In 1871 he became a member of the Council, and in 1860 he was elected to the Presidency, a position he held for two years. He was well known to pharmacists in all the larger cities on the continent, and had traveled quite extensively. He was an accomplished microscopist, and had written many papers on microscopic subjects. He was for two years the owner of two well-known London pharmacies—one in New Street, Dorset Square; the other in Conduit Street. His younger son, Henry G. Greenish, is the author of a text-book on materia medica and pharmacy in the School of Pharmacy of the Pharmaceutical Society. Mr. Greenish was born in Pembrokeshire, on October 15, 1817. He was apprenticed to Brecon and came to London on the expiration of his indenture. He engaged in business there and conducted it very successfully. He was a delegate from the Pharmaceutical Society to the International Congress of Pharmacy at St. Petersburg in 1874, and it

was mainly due to him that the Congress held its meeting in London in 1880. He was well known in pharmaceutical circles, being an honorary member of the pharmaceutical societies of Austria, Antwerp, Bohemia, Hungary, Poland and Russia, of the American Pharmaceutical Association, and of the Brussels Royal Society of Pharmacy. The deceased was highly respected throughout the entire world, and his endeavors for the elevation of the profession of pharmacy place him amohg the foremost of those workers. He possessed a very commanding appearance, and the fruit of his labor will ever be handed down to posterity to profit by. Notwithstanding his advanced age, he worked industriously at his profession up to the time of his death, Deceased was elected an honorary member of our Association in 1882, at the meeting held at Niagara Falls, N. Y.

John H. Hancock, a well-known retail pharmacist of Baltimore, Md., died at his home in that city on April 18, 1900, after a lingering illness. His demise was due to Bright's disease, complicated with heart trouble. Mr. Hancock was a native of North Carolina, and he received his education in the public schools of Richmond, Va. He afterwards came to Baltimore and entered the Maryland College of Pharmacy as a student, taking his degree. After his graduation he acted as a clerk in several of the largest drug stores in Baltimore, and then went to other large cities. He subsequently engaged in business for himself in Baltimore, and for the past twelve years occupied a large store at the corner of Fremont avenue and Lombard street. For a time he acted as manager of the laboratory for Reed & Carnrick, and at one time was in the employ of Wyeth & Bro. In these various positions he manifested exceptional capability and won the confidence of his employers. Mr. Hancock was prominent in pharmaceutical matters, and everything calculated to further the profession found in him an earnest and zealous supporter. He was highly respected by all his patrons, who had the most implicit confidence in his integrity. He conducted his business very succesfully, and was honored and esteemed by all his associates. He was very popular in various pharmaceutical fraternities, and his name will ever live in the memories of all the members. He was a member of the Maryland College of Pharmacy and of the Maryland Pharmaceutical Association, and had served several years as Secretary of the Maryland Pharmacy Board. The College was well represented at his funeral by a strong committee, of which a committee of one was appointed to draft a set of resolutions bearing testimony to the deep respect in which he was held. Mr. Hancock was fifty-two years of age, and the news of his death caused profound sorrow throughout the Baltimore drug circles. His wife and two children survive him. Deceased became a member of our Association at the meeting held in Baltimore, Md., in 1870.

Alexander Hudnut, founder of the famous Hudnut Pharmacy, at Ann and Broad streets, in the old Herald Building, died on February 16th, at Brighton, England. Having received a good education in the public schools, he at an early age commenced the study of pharmacy. The manifest interest taken by him in the profession, together with the business tactics displayed by him during his apprenticeship, predicted for him a bright future. The life of a drug clerk was ill-suited to him, his chief ambition being to possess a pharmacy of his own. In 1855 the Hudnut Pharmacy was founded on a moderate scale in Court street, Brooklyn. It was, to all appearance, an ordinary apothecary shop. Upon the erection of the Herald Building, at Ann street and Broadway, Mr. Hudnut leased accommodations for a pharmacy, and removed his business to New York. It was then that his prosperity began. Here he conducted one of the largest stores in the country, and acquired a reputation throughout the United States. Upon the first indication of failing health, Mr. Hudnut sold his business to H. L. Cutter, who had been associated with him in business. The price paid was two hundred and fifty thousand dollars, and the concern was continued under the name of Hudnut's Pharmacy. Mr. Cutter subse-

quently transferred it to Frederick F. Anness and George H. Bancroft, who, for its control, formed a New Jersey corporation. While he lived in America Mr. Hudnut's residence was in South Orange, N. J. Deceased was seventy years old, and after his health began to fail, several years ago, he had lived in France and England. His life, however, on the Continent was secluded. At the time of his death his children were all in America. He was honored and respected by everybody, and the news of his death caused sorrow in the hearts of all his acqaintances. Mr. Hudnut united himself with our Association in 1857, at the meeting held in Philadelphia. He was one of its oldest members, having joined but a few years after its organization.

Hugh H. Osgood, of Norwich, Conn., accompanied by his wife, left Norwich on October 7th for Niagara Falls, where Mr. Osgood attended the National Convention of Wholesale Druggists. Upon his return, he was taken ill at Buffalo, where he remained for a few days. Upon his recovery he went to Manlius Village, near Syracuse, N. Y. Here he was again prostrated with a cold which afterwards developed into pneumonia, and together with heart failure caused his death. For several years previous Mr. Osgood's health had been somewhat poor. Deceased was born in Southbridge, Mass., October 10, 1821. He was the son of Artemas Osgood and Salona Johnson. At the age of ten years he came to Norwich and lived with an uncle, and later with his parents, who subsequently moved there. As a boy, Mr. Osgood had an ambition to be a druggist, and entered the employ of Samuel Tyler & Son, and within a few years his fond hopes were fully realized. In 1842 Mr. Osgood and an uncle, Dr. Charles Lee, started a drug store under the firm name of Lee & Osgood. It was located in the room now occupied by the firm for part of its wholesale business. The business prospered, and it now occupies two large buildings, and is one of the leading drug houses in the State. Dr. Lee died thirty-five years ago, and Mr. Osgood continued the business at the old stand. Mr. Osgood took a deep interest in public matters and in almost every enterprise that was started to benefit Norwich. Mr. Osgood served several terms as a member of the common council from 1875 to 1886. During his administration a large number of improvements were made. He was interested in many enterprises in Norwich, serving as an officer in not less than fifteen of them. He was one of the organizers of the Kitemaug Association, and its president. He was a charter member of the Norwich Club, and belonged to the Arcanum Club. In educational matters he took a deep interest and was a trustee of the Free Academy. He served as treasurer of the Central School District, a member of the advisory committee of the United Workers, and president of the City Mission. He was the first president of the Norwich Board of Trade, and always maintained an interest in the organization. He was also identified with a large number of lodges and societies in Norwich. In June, 1892, Mr. Osgood was married to Mary Ruth Lee, of Manlius Village, N. Y. She survives her husband. At public meetings, where Mr. Osgood was often chosen to act as presiding officer, he always proved able and thoroughly impartial. His remarks were invariably concise and to the point, Mr. Osgood gained success by his own ability and unaided efforts. He was a business man of the old school, and had the full confidence of all his patrons. His disposition was retiring, and all honors came to him unsought. He was kind and sympathetic and took delight in relieving distress without ostentation. In employees Mr. Osgood took a fatherly interest. Young men had a great attraction for him, and he was always ready to give them advice. In his home he was seen at his best. His death cast a gloom over the entire community. Mr. Osgood became a member of our Association in 1875, at the meeting held in Boston, Mass.

Thomas Henry Sands Pennington, for more than a generation engaged in the drug business at Saratoga, N. Y., died March 3d, 1900, after having submitted to an operation for a certain ailment. Mr. Pennington was born in Hartford, Conn., in 1845. When a mere boy, he moved to Albany, N. Y., where he was apprenticed to Dr. Elkins

of that place. He pursued diligently the study of pharmacy, and was recognized as possessing great business abilities. When the pharmacy of H. B. Clement was established, he identified himself as an assistant, and served his employer with credit and distinction. Later in life, he entered the employ of P. A. White, one of the most prominent pharmacists in New York city, but remained there only a few years, leaving there in 1867, and moving to Saratoga Springs, N. Y., to accept a more lucrative position in the pharmacy of F. T. Hill & Co. After serving the firm faithfully for thirteen years, he at length, in 1880, succeeded to the business, which he conducted very successfully for a period of seventeen years, when he was obliged to retire from active business life, owing to a physical infirmity, from which he suffered for nearly three years. With the hope and expectation that through surgical skill his disability would be removed and restoration to health insured, he submitted to an operation the latter part of February last. He rallied well at first, and appeared to be convalescing, but suffered a relapse, and on the 3d of March died very suddenly. His wife and one daughter survive him. Deceased was a highly respected citizen, and by his death the community lost one who always stood ready to champion any cause which tended to the welfare of others. His pleasing disposition won to him many warm friends, and caused him to be loved and esteemed by all. Deceased became a member of our Association at the meeting held at Toronto, Can., in 1877.

M. Gustave Planchon, Director of the Paris Superior School of Pharmacy, President of the Paris Society of Pharmacy, and President of the International Congress of Pharmacy of 1900, died suddenly on Good Friday, April 13th, at the age of sixty-six years. The son of a workingman in a village in the Cevennes Mountains, Gustave Planchon had an elder brother, Emile, who, by hard study and privation obtained a position in the Montpelier School of Pharmacy. Stimulated by the brother's help and example, Gustave embraced the same profession. Every hour he could honestly spare from the pharmacy counter was devoted to his favorite study of botany. He studied at Montpelier, but took his Pharmacy and Sc. degrees at Paris in 1864. He spent a couple of years at Lausanne as Professor of Botany, and then returned to Montpelier, but was named Professor of Materia Medica at the Paris School of Pharmacy in 1866, and upon the retirement of Prof. Chatin, succeeded him as Director in the School, which may be considered the highest position French pharmacy can offer to its followers. His many virtues, his filial affection, unwearying industry, absence of jealousy and almost of ambition, his natural kindly and genial disposition, his sincere religious belief, his love for science and truth, his genuine sympathy with the students and all around him, are a worthy example to be followed by all. Simple, unaffected and retiring by nature, he had a singularly winning face and manner, which immediately put the most timid completely at his ease, and was, moreover, never belied by his words or actions. Placed by his official position over the heads of men of almost world-wide scientific reputation, his genuine worth and good nature disarmed jealousy. His scanty leisure hours he devoted to the study of the history of pharmacy in by gone days. He had collected in printed form many curious details as to the apothecaries of past centuries, and his series of pamphlets on the history of the Paris School of Pharmacy should be read by all interested in the pharmaceutical educational establishments of long ago. M. Planchon was the author of many scientific publications, among which are his papers on Quinquinas, Ipecacuanhas, Jaborandi, etc., and his great work, the "Treatise on Simple Drugs of Vegetable Origin." His home was next door to the School of Pharmacy. He had been a widower for many years. His only son had not followed in his father's footsteps, but his nephew, Dr. Louis Planchon, of Montpelier, is Professor of Materia Medica at the local School of Pharmacy. His funeral ceremony was very impressive. On the coffin lay the official robes and cap of the deceased; at the foot was a handsome floral cross. Above, on the gable, the tri-colored flag was tied around with crape, and all around the

pall were grouped the chief mourners, the officiating clergymen and the professors of the school, with delegates from the other Faculties of the Paris Universities, these latter in their rich robes of office, hundreds of pharmacists, scientific men and sympathizers. Outside the gate stood a detachment of infantry and a curious crowd. All hats were reverently lifted as the procession began. The services over, the funeral procession began to wind its way to Mount Parnasse Cemetery, where interment was made. On the way the hearse was saluted by every passer-by. Deceased was elected an honorary member of our Association at the meeting held at Toronto, Canada, in 1877.

Thomas D. Reed, one of the most well-known and highly respected citizens of Montreal, Canada, died at the Royal Victoria Hospital in that city on March 30th, 1900, having been stricken with apoplexy several days previous. Mr. Reed received a fall last autumn, and after that never had been feeling very well. His heart was affected by the accident. He attended to several duties up to the time of his death, but complained of his heart from time to time. Mr. Reed was born at Albany, N. Y., in 1840. He came to Montreal at an early age. He was educated at the high school and Philip school. In 1855 he entered the drug establishment of Lamplough & Campbell, and served them faithfully for ten years. After that he engaged in business for himself, and for six years conducted a retail pharmacy in the west end of Montreal. In 1871, he graduated as M. D. at McGill University, and was subsequently elected lecturer in the College of Pharmacy at Montreal. In 1876, he was appointed to the chair of Materia Medica in the College, and in 1895 he became Dean of the Faculty. For a number of years he lectured on hygiene at the Normal School in Montreal. For the past six years he occupied the position of Scientific Editor of the Montreal Pharmaceutical Journal. Mr. Reed was made a justice of the peace for the city and district of Montreal in 1898. He was a member of St. George's Society. He married the daughter of the late Rev. Alfred Booker, of Hamilton, Ont. A son and daughter survive him, his wife dying in 1889. He was very conscientious in all his undertakings, and was much devoted to the interests of pharmacy. He led an upright, Christian life, and was much admired by all who knew him. His name will be handed down to posterity as one who labored indefatigably for the elevation of the profession of pharmacy. Deceased became a member of our Association at the meeting held at Montreal, Can., in 1896.

Peter Robertson, one of the most well-known and respected pharmacists of Newberry, S. C., died at his home in that city after a lingering illness on the 25th of January, 1900, at the age of fifty-two years. Deceased was born in the city of Charleston, S. C., on July 8th, 1847, and spent the earlier years of his life in his native city. He chose pharmacy as his profession, and prepared himself at the Charleston College of Pharmacy, from which he graduated with the highest honor of his class. He came to Newberry in 1875 to engage in the drug business, and on June 16th, 1877, he was married to Miss Alice L. Hunter, who survives him. Subsequently he spent several years in Charleston, but returned to Newberry in 1884, where he resided and conducted a successful business until the day of his death. He was a man of quiet spirit and tender sympathies, as well as of true and broad culture, which qualities gained for him many warm friends. He was also a man eminent in his profession, being at the time of his death the President of the State Pharmaceutical Association, and a member of the State Board of Examiners. In his death the community sustained a great loss. His charitable disposition and kind words won for him a tender spot in the hearts of those who needed his assistance. He was a true Christian in every respect, not only in the church, but in all the daily affairs of his life, and every person who had any dealings whatever with him cannot but always speak well of him. His funeral was largely attended, and interment was made in Rosemont cemetery at Newberry. Deceased became a member of our Association at the meeting held at Montreal, Can., in 1896.

Eugene James Russell, of Baltimore, Md., died at the home of his son, Thomas F. Russell, a well-known druggist of that city, on August 26th, 1899, after a brief illness. His death was due to heart failure and old age. Mr. Russell was born in Montebello, Miss., in 1820, and came to Baltimore with his parents at the age of twelve years. He was shortly afterwards apprenticed to the well-known firm at that time of C. Thorp & Co., on North Howard Street. Having served faithfully the usual time as apprentice, he returned to his native city, where he accepted a position at the Charity Hospital, under the charge of his uncle, Dr. James Magee, a well-known physician of the South. After holding this position for a number of years, he returned to Baltimore, and in 1845 went into the drug business at the northeast corner of Ann Street and Canton Avenue, and soon built up a large and profitable trade and continued to do so up to the time of his failure in health, about two years ago He then retired from active business, making his home with his son until the time of his death. He was one of the oldest members of the Maryland College of Pharmacy and also a member of the State Pharmaceutical Society. He was a prominent member of the I. O. O. F. He is survived by his son and two daughters. Deceased was respected by a large circle of friends and acquaintances, who deeply mourn his loss. Having almost attained the ripe old age of fourscore years, he still possessed all the noble characteristics which distinguished his younger life, so that his entire life may be looked upon as an example for all young men to follow. Deceased was a life member of our Association, having connected himself with the same at the meeting held in Baltimore, Md., in 1856.

Frank M. Wilson, a highly respected citizen of Willimantic, Conn., died at his home on Church Street, very suddenly, on May 1st, 1900, at the age of fifty-one years. Mr. Wilson was born in Mansfield, March 20th, 1849. His education was in the grammar and high schools, and his first business venture was as a drug clerk in Rockville. In his chosen profession he had flattering success. He came to Willimantic about thirty years ago, and engaged as a drug clerk with Dr. Fred. Rodgers, where he remained for ten years, living with Dr. Rodgers' family. In 1878, he formed a partnership with John L. Leonard, of this city, and bought of William C. Fuller the old Jason Safford drug store, it being the oldest stand in the city, having been established in 1829. This partnership was continued until 1890, when he sold a half interest in the business to his then clerk, William P. Jordan, and continued the business under the firm name of F. M. Wilson & Co. until May, 1898, when Mr. Wilson bought his partner's interest. Since that time he has continued the business alone. Mr. Wilson was always enthusiastic in support of the public schools, and for many years was a member of the school board, being its president at the time of his death. He served as first selectman, and for four terms was a member of the board of burgesses under the old borough government. At the time of his death he was a member of the Willimantic Board of Trade and of the Willimantic Building and Loan Association. Mr. Wilson was elected as first representative to the Legislature of 1895, and during that session was held in high esteem by his associates. He was urged to accept the nomination for State Treasurer, but politics was distasteful to him and he declined. He served as the President of the Connecticut Pharmaceutical Association. Deceased became a member of our Association at the meeting held in Washington, D. C., in 1883.

In conclusion, your Secretary, in appreciation of the many courtesies extended to him by the officers and members of the Association by furnishing him information relative to deceased members and other matters when asked, the promptness of which had considerable to do with making the duties of his office comparatively light, desires to extend his sincere thanks to all.

Respectfully submitted,

GEO. W. KENNEDY,
Secretary Committee on Membership.

Mr. Huested moved to adopt the report.

THE PRESIDENT: I am sure this Association enters with sympathetic interest into this record of the loss by death of some of our worthy members, and we desire to extend to all their nearest friends and relatives greetings of our warmest sympathy, and extend the sympathy which we all feel in this fraternal bond—workers in pharmacy. The vote will now be taken on the acceptance and publication of this report.

The motion to accept and publish the report was carried by a unanimous rising vote.

MR. WHELPLEY: In the way of apology to members of this Association who may have been annoyed by numerous communications and urgent solicitations from the Committee on Membership, I desire to make this statement of facts as furnished by the Treasurer:

Commencing with the year 1896, the Association has lost in membership, and has continued to do so down to the present time, in spite of our strenuous efforts to add new and desirable members. The figures are as follows:

In 1896, we gained 91 members and lost 213.

In 1897, we gained 119 members and lost 132.

In 1898, we gained 85 members and lost 124.

In 1899, we gained 57 members and lost 142 (nearly three times as many lost as gained).

This year, as near as we can figure it, we will gain 115 members and lose 140, leaving us minus 25.

MR. EBERT: That is, in twenty-seven years we have only gained about 200 members. We had a thousand members at Richmond in 1873.

MR. KENNEDY: Mr. President, I move that the gentlemen whose names were proposed to the Association for membership in the early part of the session be now invited to become members of this Association.

The motion was seconded by Mr. Mason and carried.

The hour of 12 m. having arrived, the Chair declared that, in accordance with the motion of Mr. Sheppard heretofore adopted at this session, a recess would now be taken to 3 o'clock this afternoon, when the business of the second general session would be resumed.

The Association was called to order again at 3:30 p. m., and the report of Committee on Excursion to Europe was called for, and Mr. Mayo, Chairman, made the following report, with accompanying resolutions:

REPORT OF COMMITTEE ON EUROPEAN TOUR.

Your Committee on European Tour beg leave to state that they have perfected arrangements under which any member of the Association, or person endorsed by a member of the Association, can secure special tickets for $280.00, providing for a thirty-five-days' tour, visiting London, Dover, Ostend, Brussels, Paris, and including all expenses, save luncheon when ashore. These tickets provide for a first-class steamer passage, going out on the "Aller," on June 27, and are good to return on any of the Nord Deutscher Lloyd steamers within a year from the date of issue.

Provisions are made for a number of side trips at some additional expense. They include:

An extra week in London or Paris, which will cost $14.00 to $20.00, according to hotel selected.

Optional Holland side trip. Leaving London at 8 p. m., Tuesday, July 10th, via The Hague, Scheveningen, Rotterdam, and Antwerp, rejoining party in Brussels July 12th. $10.00 extra. Carriage drives included at The Hague, Rotterdam and Antwerp.

A nine-day extra Swiss trip, including the Bernese Oberland and Mont Blanc regions (Interlaken, Berne, Chamounix, Geneva, etc.), $70.00 extra.

A Holy Land tour, including Central Europe, Egypt, Palestine, Turkey, Greece, and home by North German Lloyd fast steamer via Gibraltar.

An optional side trip to Munich, Ober-Ammergau and the "Passion Play," $20.00 extra (in connection with B, C, D or E annex trips).

A Grand Tour, continuing on steamer "Aller," to Bremen, July 6th, visiting Berlin, Dresden, Munich (Ober-Ammergau "Passion Play,)" Lucerne, Heidelberg, Mayence, Rhine, Cologne, Brussels, Paris, Calais, Dover, Canterbury, London, Southampton, New York; and

Tours, crossing Europe and returning from Genoa and Naples by North German Lloyd steamer via Gibraltar.

The excursion in question is conducted under the auspices of the Palestine Commandery No. 18, Knights Templar, stationed at New York city.

The high social standing of the members of this Commandery insures that those who take part in the tour will have agreeable companions.

Interested members can obtain further particulars by addressing the Chairman of the Committee.

In submitting this report your Committee beg leave to move the adoption of the following resolution:

"*Resolved*, That the American Pharmaceutical Association recommend to such of its members as desire to take a European tour the special excursion of Palestine Commandery Knights Templar, leaving New York on the excursion steamer "Aller," on June 27th, in charge of J. E. Barnes, No. 344 Fourth ave., New York city.

Respectfully, CASWELL A. MAYO, *Chairman.*

On motion of Mr. Sheppard, seconded by Mr. Lowe, it was ordered that the report be received and the recommendations adopted.

On motion of Mr. Sheppard, seconded by Mr. Oldberg, the Committee on Excursion to Europe was continued for the time being.

The Secretary called attention to the fact that no other chairmen of committees were present, and suggested that officers' reports might be read at this juncture—the reports of the Treasurer and Secretary. It was so ordered, and the Treasurer made his report as follows:

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, JULY 1, 1899, TO APRIL 1, 1900.

RECEIPTS.

Cash on hand July 1, 1899	$2,649 10
Received from the sale of 5 Certificates @ $5.00	25 00
Received from the sale of 2 Certificates @ $7.50	15 00
Received from the sale of Proceedings	37 30
Received from the sale of Badges and Bars	56 45
Received from the sale of National Formulary	313 93
Received from Interest on Deposit in New England Trust Company, Boston	29 73

Received from Interest on Money Invested in Bonds (General Fund)		$60 00
Received from the Ebert Fund		28 00
Received from Annual Fees, 1896	$10 00	
Received from Annual Fess, 1897	175 00	
Received from Annual Fees, 1898	295 00	
Received from Annual Fees, 1899	2,490 00	
Received from Annual Fees, 1900	60 00	
		3,030 00
Received from Life Membership Fees, viz.:		
Frederick B. Power	$30 00	
John U. Lloyd	20 00	
Henry C. Porter	30 00	
		80 00
Proceeds of Promissory Note		1,000 00
Total		$7,324.51

1899. DISBURSEMENTS.

August	7.	Check No. 758. George W. Kennedy, Second half year's salary as Secretary of Council, 1898–1899	$75 00	
		Second half year's salary as Secretary of Committee on Membership, 1898–1899	75 00	
				$150 00
	7.	Check No. 759. S. A. D. Sheppard, Second half year's salary as Treasurer, 1898–1899		375 00
	7.	Check No. 760. Chas. Caspari, Jr., Second half year's salary as General Secretary, 1898–1899		375 00
	14.	Check No. 761. Wickersham Printing Company, Section on Scientific Papers		25 95
	14.	Check No. 762. John S. Bridges & Co., Printing and Stationery		29 00
September	9.	Check No. 763. Henry Briele, Badges and Bars		74 25
	9.	Check No. 764. Caswell A. Mayo, Committee on Transportation		8 00
	9.	Check No. 765. A. B. Lyons, Section on Education and Legislation		3 70
	9.	Check No. 766. Chas. Caspari, Jr., Committee on Transportation	$11 00	
		National Formulary	1 99	
		Proceedings	6 29	
		Miscellaneous	16 47	
				35 75
	9.	Check No. 767. C. B. Lowe, Section on Education and Legislation		5 79
	27.	Check No. 768. Henry P. Hynson, Committee on Practical Pharmacy and Dispensing		14 65
	27.	Check No. 769. S. A. D. Sheppard, Traveling Expenses		48 85
	27.	Check No. 770. Chas. Caspari, Jr., Traveling Expenses		20 71
	30.	Check No. 771. Wickersham Printing Company, Printing and Stationery		14 70
	30.	Check No. 772. Evening Chronicle, Printing and Stationery.		21 25
	30.	Check No. 773. H. H. Rusby, Section on Scientific Papers.		13 59

October	6.	Check No. 774. J. G. McLean, Stenographer		$150 00
	6.	Check No. 775. H. C. Kendall, Miscellaneous		3 00
	6.	Check No. 776. Wickersham Printing Company,		
		Proceedings	$8 00	
		National Formulary	33 00	
				41 00
	11.	Check No. 777. A. B. Prescott and H. M. Gordin, First General Prize		50 00
	11.	Check No. 778. John U. Lloyd, Second General Prize		30 00
	11.	Check No. 779. William A. Puckner, Third General Prize		20 00
	11.	Check No. 780. Henry Kraemer, J. M. Maisch Prize.	$50 00	
		Ebert Prize	28 00	
				78 00
	11.	Check No. 781. S. C. Malone, Miscellaneous		10 00
	20.	Check No. 782. Allen & Co., Printing and Stationery		44 50
November	6.	Check No. 783. American Security and Trust Co., Miscellaneous		5 00
	27.	Check No. 784. J. O. Schlotterbeck, Proceedings		40 00
	7.	Check No. 785. John S. Bridges & Co., Printing and Stationery	$9 78	
		Committee on Transportation	3 68	
		Committee on Membership	7 45	
		Section on Scientific Papers	3 07	
		Section on Commercial Interests	4 39	
		Section on Education and Legislation	4 76	
				33 13
	7.	Check No. 786. Alpha Photo. Engraving Co., Proceedings		42 09
	7.	Check No. 787. American Druggist Publishing Co., Proceedings		3 15
	7.	Check No. 788. Lewis C. Hopp, Committeee on Transportation	$6 00	
		Miscellaneous	15 00	
				21 00
	13.	Check No, 789. C. Lewis Diehl, second half year's salary as Reporter on Progress of Pharmacy, 1898–1899		$375 00
	13.	Check No. 790. John S. Bridges & Co., Printing and Stationery		27 00
	20.	Check No. 791. James M. Good, Medal for George W. Kennedy		12 00
1900.				
January	8.	Check No. 792. Wickersham Printing Company,		
		Proceedings	$1597 59	
		Printing and Stationery	15 00	
		Section on Education and Legislation	5 25	
				1,617 84
	8.	Check No. 793. Chas. Caspari, Jr., Proceedings	$24 60	
		National Formulary	1 12	
		Insurance	10 00	
		Journals	25 57	
		Miscellaneous	6 68	
				67 97

January	8.	Check No. 794. S. A. D. Sheppard, first half year's salary as Treasurer, 1899–1900		$375 00
	8.	Check No. 795. George W. Kennedy, first half year's salary as Secretary of Council, 1899–1900	$75 00	
		First half year's salary as Secretary of Committee on Membership, 1899–1900	75 00	
				150 00
	8.	Check No. 796. C. Lewis Diehl, first half year's salary as Reporter on Progress of Pharmacy, 1899–1900	$375 00	
		National Formulary	35 00	
				410 00
	8.	Check No. 797. Chas. Caspari, Jr., first half year's salary as General Secretary, 1899–1900		500 00
	16.	Check No. 798. Daniel Base, Proceedings		20 00
	16.	Check No. 799. S. A. D. Sheppard & Co., Miscellaneous		30 69
	16.	Check No. 800. Wickersham Printing Company, Section on Scientific Papers	$4 75	
		Section on Education and Legislation	4 25	
		Committee on Practical Pharmacy and Dispensary	4 00	
				13 00
	18.	Check No. 801. C. Lewis Diehl, National Formulary		60
	24.	Check No. 802. John S. Bridges & Co., Printing and Stationery	$3 50	
		Section on Scientific Papers	2 16	
		Proceedings	4 50	
		Miscellaneous	26 96	
				37 12
	24.	Check No. 803. Wickersham Printing Company, Proceedings		241 83
February	14.	Check No. 804. Wickersham Printing Company, Proceedings	$271 45	
		National Formulary	9 43	
				280 88
	14.	Check No. 805. A. Hoen & Co., Certificates for Life and Honorary Members		229 50
	14.	Check No. 806. Wickersham Printing Company, National Formulary		78 77
	14.	Check No. 807. John S. Bridges & Co., Printing and Stationery		17 86
		Check No. 808. Not used.		
March	1.	Check No. 809. Wickersham Printing Company, National Formulary		33 00
	17.	Check No. 810. W. W. Kerr, Committee on Membership		14 50
	23.	Check No. 811. American Bonding and Trust Company, Premium on Treasurer's Bond		12 50
March	23.	Check No. 812. Wickersham Printing Company, Proceedings	$31 69	
		National Formulary	1 87	
				33 56
	26.	Check No. 813. Chas. Caspari, Jr., Certificates for Life and Honorary Members	50 74	

	Journals	20 07		
	Proceedings	2 89		
	National Formulary	1 08		
	Miscellaneous	9 66		
				84 44
29.	Check No. 814. J. W. Whelpley, Treasurer, Miscellaneous.			6 53
29.	Check No. 815. Meyer Bros. Drug Company, Committee on Membership			3 55
				$6,460 20
1899 November 21.	Life Membership Fund, Frederick B. Power	30 00		
1900 January 22.	Life Membership Fund, John U. Lloyd	20 00		
March 6.	Life Membership Fund, Henry C. Porter	30 00		
				80 00
				$6,540 20

SUMMARY OF DISBURSEMENTS, NINE MONTHS, JULY 1, 1899, TO APRIL 1, 1900.

Proceedings	$2,294 08
Stenographer	150 00
Journals for the Reporter on the Progress of Pharmacy	45 64
Salaries, Second half of the year 1898 to 1899	1,275 00
Salaries, First Half of the Year 1899 to 1900	1,400 00
Premium on Treasurer's Bond	12 50
Traveling Expenses	69 56
Section on Scientific Papers	49 52
Section on Education and Legislation	23 75
Section on Commercial Interests	4 39
Committee on Membership	25 50
Committee on Transportation	28 68
Special Committee on Practical Pharmacy and Dispensing	18 65
Printing and Stationery	182 59
Insurance	10 00
Badges and Bars	74 25
General Prizes	100 00
Ebert Prize	28 00
Maisch Prize	50 00
Medal for George W. Kennedy	12 00
Special Certificates	280 24
Miscellaneous Expenses	129 99
National Formulary	195 86
Life Membership Fund	80 00
Total amount of disbursements	$6,540 20
Cash on hand	784 31
Total	$7,324 51

PROSPECTIVE ASSETS.

There is now outstanding on the books of the Association:

Annual dues for 1899	$725 00
Annual dues for 1900	4,840 00
	$5,565 00

The above amount does not include what is due from members whose names will probably be dropped from the roll this year, nor from members whose residence is unknown.

Respectfully submitted, S. A. D. SHEPPARD, *Treasurer.*

Boston, Mass., April 1, 1900.

THE PRESIDENT: Gentlemen, you have heard the report of your Treasurer; what will you do with it? The report of your Auditing Committee, to whom the Treasurer's Report was referred, was read at the previous session.

Mr. Mayo moved to adopt, which motion was seconded and carried.

The Secretary presented the following as his Financial Report for the past nine months:

REPORT OF FINANCIAL ACCOUNTS IN THE CARE OF THE GENERAL SECRETARY.

A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF NATIONAL FORMULARY, FROM JULY 1, 1899, TO APRIL 1, 1900.

I. Receipts.

From Sales and Payment of Bills due July 1, 1899		$313 93

II. Expenses.

Paper and Press Work (printing 1000 copies)	$78 77	
Binding 600 copies in cloth, at 11 cents	66 00	
Expressage and Postage	15 49	
Expenses of Preparing Manuscript of Physicians' Epitome; Stenographer, Postage and Printing	35 60	
		195 86

III. Remittances.

To Treasurer, as per Treasurer's Receipts	313 93

IV. Sales.

To dealers and individuals, as per ledger accounts	288 49

V. Accounts Unpaid.

By dealers	63 69

VI. Bills Due by the Association.

All bills due to date have been paid.

VII. Stock on Hand.

Copies in flat sheets (unbound)	915
Copies bound in cloth	281
Copies bound in cloth, interleaved	4
Copies bound in sheep	27
Copies bound in sheep, interleaved	10
	1237

B. SUMMARY OF TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF NATIONAL FORMULARY SINCE 1888.

Receipts to June 30, 1899 (see Proc., Vol. 47, p. 33)	$11,182 51	
Receipts from July 1, 1899, to April 1, 1900	313 93	
		$11,496 44
Expenses to June 30, 1899 (see Proc., Vol. 47, p. 33)	$6,547 75	
Expenses from July 1, 1899, to April 1, 1900	195 86	
		6,743 61

C. SALE OF PROCEEDINGS.

From July 1, 1899, to April 1, 1900	$37 30	
Remitted to Treasurer, as per Treasurer's receipts		37 30

D. ACCOUNT OF BADGES AND BARS.

	Badges.	Bars.
July 1, 1899. On hand, as per Secretary's Report	16	69
Aug. 1899. Received from H. Briele, manufacturer	25	40
	41	109
Badges sold from July 1, 1899, to April 1, 1900, 14, at $2.00	$28 00	
Bars sold from July 1, 1899, to April 1, 1900, 31, at 75 cts. each.	23 25	
7, at 60 cts. each.	4 20	
2, at 50 cts. each.	1 00	
		$56 45
Remitted to Treasurer, as per Treasurer's receipts		56 45
Balance on hand, April 1, 1900: Badges	27	
Bars	69	
Total Receipts from Sale of Badges and Bars to June 30, 1899 (see Proc., Vol. 47, p. 34)	$713 45	
Receipts from sale of Badges and Bars, from June 30, 1899, to April 1, 1900	56 45	
		769 90
Total cost of Badges and Bars to June 30, 1899		$680 10
Cost of 25 Badges, August 30, 1899 @ $1.85		46 25
Cost of 40 Bars, August 30, 1899, @ .70		28 00
		$754 35

CHAS. CASPARI, JR., *General Secretary.*

Baltimore, April 1, 1900.

On motion of Mr. Holmes, duly seconded, the report was ordered received, and referred for publication.

The Secretary announced that he had carried out the sense of the resolution passed last year in regard to sending a congratulatory letter to Dr. Squibb on the occasion of his 80th birthday, and read the following reply that he had received:

BROOKLYN, *October 12, 1899.*

MR. CHAS. CASPARI, JR., *Secretary, Baltimore:*

My Dear Sir: Your favor of the 9th came duly, and yesterday the parcel by express was received.

I thank the Association very much for its favorable appreciation of my work and for its congratulation on my advanced age; and for the beautiful form in which its senti-

ments are expressed. Sorry I have not more time and vigor left to better live up to so high a degree of appreciation.

Very sincerely yours, E. R. SQUIBB.

THE PRESIDENT: The reply of Dr. Squibb in response to the letter written by our General Secretary will, without objection, be received and referred for publication. It is a great satisfaction to the Association to receive such a reply, and to have his continued interest in our organization.

The Secretary stated that the report of the Committee on Publication had been presented to the Council and read before that body, but had not yet been read to the Association in general session.

Mr. Mayo moved to read by title and refer for publication. Carried.

The report of the Delegation to the National Association of Retail Druggists was next called for, and Mr. Good, Chairman, after explaining that he was not present at the meeting of the N. A. R. D. at Cincinnati, but that Mr. Hopp was there, and had, at his request, prepared a report, read the following:

RICHMOND, VA., *May 7, 1900.*

Mr. President and Members of the American Pharmaceutical Association:

Gentlemen: The first annual meeting of the National Association of Retail Druggists was held in Cincinnati, October 3–6, 1899, and was presided over by our genial and staunch friend of the American Pharmaceutical Association, Mr. Hynson, of Baltimore, he being the Association's first President.

Of the members appointed delegates, Messrs. E. F. Phillips, of Armada, Mich., Thos. Layton, of St. Louis, Mo., and L. C. Hopp, of Cleveland, O., were present; and it gave us pleasure to note the very hearty and cordial reception accorded the American Pharmaceutical Association.

The meeting was largely attended, it being, as you well know, composed of delegates representing State and local organizations, and the enthusiasm was great; the very atmosphere was laden with enthusiasm to such an extent that the local papers published columns of the transactions of the meeting.

All of the sessions were well attended, each having at least ninety per cent. of all delegates present, and the closest attention was given to the very able address of the President, the exhaustive report of Mr. Holliday, Chairman of the Executive Committee, Secretary Wooten's admirable report and Mr. Lowe's report of the finances of the Association. As the above have all been published in the various pharmaceutical journals, we will not make reference to any, as they, no doubt, have all been read by members of our Association. Of the officers elected for the ensuing year, the President, Simon N. Jones, of Louisville; Second Vice-President, Thos. Layton, of St. Louis; Secretary, Thomas V. Wooten, of Chicago; Treasurer, C. T. Heller, of St. Paul, Minn., are members of the American Pharmaceutical Association.

Now, in view of so many of the active workers of the National Association of Retail Druggists being members of our Association, we would suggest to this Association that a Committee or the Council consider the advisability of the National Association of Retail Druggists holding its meeting at the same time we hold our meetings, each organization to retain its own and distinct Association, sessions to be held alternately. This would lessen the expense of our meetings somewhat, and collectively make the attendance twice as large as at present; besides, it would lessen the expense of individual mem-

bers of time and money and it surely would be beneficial to both organizations. It will also lessen the burden of the Transportation Committee of both organizations, since neither of the Committees know until the last moment whether they have enough railroad certificates to secure the usual reduced fare returning.

LEWIS C. HOPP,
E. F. PHILLIPS.

THE PRESIDENT: You have heard this report of the delegation to the Cincinnati meeting of the National Association of Retail Druggists. As to the question presented of the simultaneous meeting of the two affiliated bodies—the National Association of Retail Druggists and the American Pharmaceutical Association—that may be considered in general session or in the Section upon Commercial Interests. What is your pleasure?

Mr. Oldberg moved to refer the report to the Council, and it was so ordered.

THE SECRETARY: I have here the report of the delegation to the Pure Food and Drug Congress, with a request from the Chairman, Mr. Geisler, of New York, to hand it to one of the other members of the committee, but I do not find them present. It is quite a voluminous report. Possibly Mr. Geisler has gone to considerable trouble to prepare it. The Association might act on it in some way at this time.

THE PRESIDENT: This is a report upon the subject of Legislation, manifestly. It would perhaps not be inappropriate—whether advisable or not I cannot say—to refer it to the Section upon Education and Legislation.

Mr. Seabury, seconded by Mr. Pettit, moved to so refer, and it was so ordered.

The Treasurer suggested that, under the by-laws, the report of the Committee on Time and Place of Next Meeting was required to be made at this session. It was ordered read, and Mr. Sheppard presented it as follows:

The Committee appointed to select the time and place of the next meeting of the Association have agreed to recommend the City of Saint Louis, Mo., as the place, and the second Monday of September, 1901, as the time.

For the Committee, S. A. D. SHEPPARD, *Chairman.*

Mr. Klein, seconded by Mr. Knoefel, moved to substitute Hot Springs, Ark., for St. Louis, in the report.

Mr. SHEPPARD: It is only fair to the members of the committee to state very briefly what were the arguments that induced the committee to bring in that report.

It is not necessary to say that the committee were thoroughly unbiased. I don't think any member of the committee—other than, possibly, the St. Louis member, Mr. Whelpley—went into the committee-room with any feeling of prejudice in favor of one place as against another. The proposition is simply this: We are now meeting in the East. Last year we met at Put-in-Bay, which is not very far West. The year before that we met at Baltimore. In the year 1902—the semi-centennial year of the Association—we shall meet in Philadelphia, provided the vote of the Association several years ago is carried out, as it undoubtedly will be. The geographical argument came up, therefore, and the committee voted that it would be wise to meet west of the Alleghany mountains, because if we should meet east of the Alleghanies next year, it would bring four consecutive meetings in the eastern part of the country. Then the question was, what

part of the western country should we go to? We have been to the Northwest quite recently. We went to the northern part of the central section last year. We are now in a Southern city, and meeting in the southern latitudes requires the meetings to be held at a different time of the year from the customary one, viz.: the latter part of the summer season. Now, it will be thirty years next year since a meeting was held in the great city of St. Louis. The financial interests of the Association are demanding our attention. Its increase of membership is very largely affected by meeting in a portion of the country where there is a large population from which to draw. Then there is the question of influence by this Association upon the various sections of the country. It is a fact of history that this Association always leaves behind it a permanent local influence. As illustrative of that, take my own section as an example—New England. When the Association met there in 1865 it gave pharmaceutical institutions such an impetus that the Massachusetts College of Pharmacy, which had been in existence since 1821, became from that time a teaching college. It met there again in 1875, and that was the beginning of the best era of good feeling that New England has ever known—especially Boston. The Boston Druggists' Association was formed. I think that experience can be duplicated everywhere in the country.

Therefore, the great city of St. Louis immediately attracted your committee's attention, and we debated the matter at great length. I think the sense of the committee would have been in favor of Hot Springs, as a resort, instead of a large city, were it not for these interests that seem to be so important and vital to the Association. There is a great center—St. Louis, where we have not been for thirty years. We shall be able to do good there, and we think we can get good by going there, and these are the reasons that decided us in naming that place.

MR. EBERLE: I move that Texas be selected as the place of next meeting, and I wish to make a few remarks in regard to Texas.

We have in the State of Texas several cities which would be very convenient for this Association to meet at. Each one has peculiar attractions of its own. We have San Antonio, that all of you have read of in history; a place memorable on account of its historic records—the Alamo, its churches, and the battles of the great heroes of Texas. We have Galveston, with its beautiful beach, as fine perhaps as any along any coast in the world. And then that city has, at all times of the year, a very agreeable climate. At no time of the year is it oppressive; so that we in Texas use it as a summer resort. Then we have Dallas, the commercial city of Texas. There we once entertained the General Assembly of the Baptist Church, and two years ago the Imperial Council of Shriners, and all spoke highly of their visit to Dallas. Again, along the borders of the Rio Grande, across the river, we have the old country of Mexico, which is a very interesting country to visit. Every time we have a National meeting in our part of the country we give them an excursion into Mexico. This can easily be arranged for.

The climate of Texas is, I know, objected to; but I will say there has never been a sunstroke in Texas, and I believe, month for month, our temperature does not rise to the temperature of St. Louis. Our summers are longer, but the temperature does not go as high as in St. Louis. The nights are always pleasant.

I hope the matter of selecting Texas will receive the careful consideration of the Association.

Mr. Knox seconded the motion to select Texas as the next place of meeting.

THE PRESIDENT: Permit me to ask the gentleman if his motion is simply to leave the place as Texas, the point to be fixed by the Association, or the Council, hereafter.

MR. EBERLE: Yes, sir. On next Tuesday our State Association convenes, purposely waiting until the close of this meeting so that they may undertake any steps necessary in regard to this matter, if this Association decides to go there. We will decide this point at our Association meeting next week.

MR. OLDBERG: All these places—Texas included, and Hot Springs—were considered by the Committee on Time and Place of Next Meeting, and the whole matter was fully discussed, voted upon, and St. Louis selected by the Committee after careful consideration.

After considerable spirited discussion by Messrs. Ryan, Nattans, Seabury, Remington, Jacobs, Good, Ebert, Skinner, Payne, Biroth and Whelpley as to the merits of Hot Springs, Ark., and the State of Texas, Mr. Eberle withdrew his plea in behalf of Texas and agreed to support the claim of Hot Springs.

The Chair put the vote upon the amendment proposed by Mr. Klein, substituting Hot Springs for St. Louis as the place of next meeting, and the amendment was lost.

THE PRESIDENT: The original recommendation of the Committee on Time and Place of Next Meeting is now before you.

Mr. Payne, seconded by Mr. Ryan, moved to amend the report by substituting Tampa, Fla., for St. Louis, but the amendment, having been put to a vote, was lost.

MR. MAYO: I move to amend the Committee's report by substituting "September," in place of the second Monday in September, as the date of the next meeting. I do this on behalf of the Committee on Transportation, with which I have been connected for some years, because it sometimes happens that by being a week earlier or a week later we can get better rates from the railroads.

MR. SHEPPARD: The Committee will accept that amendment.

THE PRESIDENT: The question is, then, upon St. Louis as the place of next meeting, and the month of September (left open as to the exact date) as the time, the Council to set the exact time hereafter.

The motion was so put and carried.

MR. GOOD: I thank you, gentlemen, and we will do a great deal more for you than we have promised, and the ladies all must come.

MR. SHEPPARD: I don't believe there will be a better time than now for Mr. Remington to say a word upon a subject close to the minds and hearts of our Association—that is our immediate welfare, and the loss of our membership in the last few years. Mr. Remington has for years had the best interests of the Association at heart, and I don't believe there would be a better time than the present for him to speak.

THE PRESIDENT: The time is at the disposal of the Association, but the meeting of the Commercial Section was set for 3:30 this afternoon. We have encroached nearly an hour on that time now, and it is only fair that we do not take more of it without a vote on that subject.

Mr. Payne seconded the motion to have Mr. Remington speak at this time.

MR. REMINGTON: I move that a committee of five be appointed by the President, at his leisure, to take into consideration the future welfare of the Association, and to report at some future time. If you do that, that ends the whole business.

The motion was seconded by Mr. Sander, and carried.

Upon motion, the Association then adjourned.

THIRD SESSION—TUESDAY AFTERNOON, MAY 8, 1900.

No business was transacted by the Association previous to the first session of the Section on Commercial Interests.

FOURTH SESSION—WEDNESDAY MORNING, MAY 9, 1900.

No business was transacted previous to the second session of the Section on Commercial Interests.

FIFTH SESSION—WEDNESDAY AFTERNOON, MAY 9, 1900.

No business was transacted previous to the first session of the Section on Scientific Papers.

SIXTH SESSION—WEDNESDAY EVENING, MAY 9, 1900.

No business was transacted previous to the second session of the Section on Scientific Papers.

SEVENTH SESSION—FRIDAY MORNING, MAY 11, 1900.

The Seventh General Session of the Association was called to order Friday morning by Chairman Prescott, in the large Committee room of the hotel, the third session of the Section on Scientific Papers giving way for the time being for that purpose.

Secretary Kennedy, of the Council, read the minutes of that body for the meeting of Wednesday, and also of Friday morning, as follows:

FIRST SESSION OF THE NEW COUNCIL—MAY 9, 1900.

The Council met for reorganization at 9:30 a. m. the following members being present: Messrs. Baker, Caspari, Diehl, Dohme, Good, Hopp, Hynson, Kennedy, Lowe, Patton, Prescott, Rapelye, Ryan, Sheppard, Thompson and Whelpley.

Temporary organization was affected by election of C. Lewis Diehl and Geo. W. Kennedy as temporary chairman and secretary respectively.

J. M. Good nominated Wm. S. Thompson for Chairman, and on motion of C. A. Rapelye, the nominee was elected by the Secretary casting an affirmative ballot.

Mr. Thompson took the Chair, and thanked the Council in a few appropriate remarks for the continued honor.

C. Lewis Diehl nominated Jas. M. Good for Vice-Chairman, and, on motion, the nominee was elected by the Secretary casting an affirmative ballot as instructed.

Chas. A. Rapelye nominated Geo. W. Kennedy for Secretary, and he was elected by H. M. Whelpley casting a ballot as directed.

C. Lewis Diehl nominated the following gentlemen to constitute the Committee on Membership: H. M. Whelpley, H. M. Whitney, Lewis C. Hopp, T. Roberts Baker, John W. Gayle, J. H. Beal, E. A. Ruddiman. The General Secretary and Treasurer of the Association are *ex officio* members of the Committee, as directed in the By-Laws of the Council.

On motion, the Committee was elected by the Secretary casting an affirmative ballot, as directed.

J. M. Good nominated Chas. E. Dohme, Chas. A. Rapelye, and Henry P. Hynson to be members of the Committee on Finance.

On motion, the nominees were elected by the Secretary casting an affirmative ballot, as instructed.

S. A. D. Sheppard nominated as members of the Committee on Publication: Chas. Caspari, Jr., C. Lewis Diehl, J. M. Good, Leo Eliel and C. B. Lowe.

On motion, the Secretary was directed to cast an affirmative ballot for the gentlemen nominated.

The formation of the Committee on Centennial Fund is provided for in Chapter VII. of the By-Laws of Council. The Committee for the next fiscal year will consist of John F. Patton, Chas. E. Dohme and Chas. Caspari, Jr,

The Chairman appointed the following Auditing Committee for the coming year: Chas. A. Rapelye, Thos. R. Shannon, Philo W. Newton.

Lewis C. Hopp nominated for the Committee on Transportation: A. E. Ebert, of Chicago; C. A. Mayo, of New York city, Chas. M. Ford, of Denver; Chas. G. Merrell, of Cincinnati; H. M. Whelpley, of St. Louis; Chas. T. Heller, of St. Paul; S. A. D. Sheppard, of Boston; A. K. Finlay, of New Orleans; Geo. F. Payne, of Atlanta: Wm. M. Searby, of San Francisco; and Chas. Caspari, Jr., of Baltimore.

On motion, the nominees were elected by the Secretary casting an affirmative ballot, as directed.

On motion of G. W. Kennedy, a recess of five minutes was taken for the purpose of allowing the various committees to select their respective chairmen.

On re-assembling of Council, the following chairmen were announced:

For Committee on Publication—Chas. Caspari, Jr.

For Committee on Finance—Chas. E. Dohme.

For Committee on Membership—H. M. Whelpley.

For Secretary of Committee on Membership G. W. Kennedy was nominated and duly elected.

On motion of S. A. D. Sheppard, Chas. Caspari, Jr., was elected Chairman of the Committee on Transportation.

The Secretary of the Committee on Membership presented the names of seventeen applicants, which list, on motion, was directed to take the usual course.

H. M. Whelpley was nominated and elected Local Secretary for the next annual meeting.

The following communication was presented by the Chairman:

RICHMOND, VA., *May 9, 1900*

To the Officers and Members of the Council, American Pharmaceutical Association:

Since my election as Local Secretary disqualifies me from membership in the Council, I hereby respectfully tender my resignation as a member of your body. H. M. WHELPLEY.

On motion of Lewis C. Hopp, the resignation was accepted.

On motion of C. Lewis Diehl, seconded by G. W. Kennedy, A. B. Prescott was nominated to fill the vacancy thus created in the Council.

C. Lewis Diehl moved that the dues of Frank Harrington, of Logan, O., be remitted, and that he be made a life member, old style, without the Proceedings, which was agreed to.

J. M. Good moved that C. Lewis Diehl be authorized to select an Auxiliary Committee of ten members of the Association to assist in revising the National Formulary. This was duly seconded and adopted.

On motion of C. B. Lowe, the General Secretary was authorized to have the Memorial of Prof. Wm. Procter, Jr., as prepared by J. P. Remington, electrotyped, and to have a sufficient number of reprints made, including five copies to be struck off on fine paper and suitably bound, of which one is to be presented each to Mrs. Procter, the two children of Prof. Procter, and J. P. Remington, and one copy to be preserved in the archives of the Association.

H. M. Whelpley moved that the General Secretary announce at the general session that reprints of the memorial can be obtained at a nominal price, and that he also inform the pharmaceutical press of this fact, which was agreed to.

Chas. A. Rapelye moved to amend the General Rules of Finance by striking out the second paragraph of the eighth Rule and inserting in place thereof the following: "The Chairman of the Council in the presence of another member of the Association shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association." This was adopted.

On motion of A. B. Prescott, the Chairman was instructed to appoint a Committee of three to confer with a like Committee from the National Association of Retail Druggists, with a view of having the two Associations meet at the same time and place.

The Chair appointed as such Committee: H. P. Hynson, J. M. Good and Lewis C. Hopp.

On motion, the Council adjourned to meet on Friday, May 11, at 9:30 a. m.

GEO. W. KENNEDY, *Secretary*.

SECOND SESSION OF THE COUNCIL—MAY 11, 1900.

The Council met at 9:30 a. m. with the following members present: Messrs. Baker, Diehl, Good, Hynson, Kennedy, Lowe, Prescott, Rapelye and Chairman Thompson, who presided.

On motion of T. R. Baker, the reading of the minutes of the first session was dispensed with.

The Secretary of the Committee on Membership presented the names of four applicants, which on motion were directed to take the usual course.

A vacancy having occurred in the Council, owing to the election of Chas. A Rapelye to the Chairmanship of the Section on Commercial Interests, J. M. Good was nominated to fill the unexpired term of Mr. Rapelye and recommended to the Association at large.

H. P. Hynson moved that all communications received by the Committee on Practical Pharmacy and Dispensing be referred to the Committee on Publication, which was adopted.

It was moved and agreed that the Council recommend that the Association establish a new Section, to be known as the Section on Practical Pharmacy and Dispensing, and that a committee, consisting of J. M. Good, C. B. Lowe and C. A. Rapelye, be appointed to suggest proper amendments to the by-laws to effect this object.

On motion the Council adjourned.

GEO. W. KENNEDY, *Secretary*.

The minutes were on motion adopted as read.

MR. WHELPLEY: Now I move that the Secretary be instructed to cast the affirmative ballot of the Association for Mr. A. B. Prescott to fill the vacancy in the Council, caused by the resignation of the new Local Secretary, and for Mr. J. M. Good to fill the unexpired term of Mr. Rapelye as a member of the Council.

The motion was put and carried, the vote was so cast, and the President announced the election of these gentlemen to fill the vacancies in the Council.

The Secretary of the Council read a list of 21 additional names proposed for membership, making a total of 120 to this time, and stated that it gave him a great deal of pleasure to say that 85 of the 120 recommended for membership had already paid their fee of five dollars for the first year's dues.

Mr. Ryan moved that these gentlemen be now invited to complete their membership, which motion prevailed.

There being no other business before the Association at this session, the Association then adjourned.

EIGHTH SESSION—FRIDAY AFTERNOON, MAY 11, 1900.

No business was transacted previous to the first session of the Section on Education and Legislation.

NINTH SESSION—FRIDAY EVENING, MAY 11, 1900.

No business was transacted previous to the second session of the Section on Education and Legislation.

TENTH SESSION—SATURDAY MORNING, MAY 12, 1900.

The Tenth General Session was called to order by President Prescott at 10:30 a. m., the third session of the Educational Section giving way for the time being for that purpose.

Mr. Kennedy, Secretary of the Council, read the minutes of the third session of that body as follows:

THIRD SESSION OF THE COUNCIL—MAY 12, 1900.

The Council convened at 9.30 a. m., the following members being present: Messrs. Baker, Beal, Caspari, Dohme, Good, Hynson, Kennedy, Lowe, Prescott, Sheppard, Thompson and Whelpley.

Vice-Chairman Good presided.

The minutes of the previous meeting were read and approved.

The Secretary of the Committee on Membership presented the names of three applicants, which, on motion of H. M. Whelpley, were referred to the Association.

The following resolution of O. Oldberg was presented from the Section on Pharma-

ceutical Education and Legislaton, and, on motion of J. H. Beal, seconded by S. A. D. Sheppard, was received and placed on record:

Resolved, That the Council be requested to prevent the interjection of entertainments throughout the sessions, so as not to interfere with the work of the various Sections.

Passed at the first session of the Section on Education and Legislation.

J. A. KOCH, *Secretary*.

Oscar Oldberg moved that not less than six hours daily, each consecutive day of the annual meeting, be devoted to the regular sessions until the business of the Association shall have been concluded.

H. M. Whelpley moved to amend the motion by inserting the words, "one-half day," in place of the words, "six hours."

W. S. Thompson moved that the resolution of the Section on Education and Legislation relating to restriction of the time for entertainments ot the annual meetings of the Association be referred to the Committee on Programme, also the motion of Mr. Oldberg, on the same subject, together with the amendment proposed by Mr. Whelpley, with the recommendation to comply with the spirit of the resolution as far as possible. This motion was duly seconded and adopted.

It was moved by Chas. Caspari, Jr., seconded by S. A. D. Sheppard, to amend Article XI. of Chapter VIII. of the By-Laws, as follows: Change present Section 4 to Section 5, and Sections 5, 6 and 7, to Sections 7, 8 and 9; insert a new Section 4, to read, "Reading of the Minutes of the Council," and a new Section 6, to read, "Reading of the Reports of the Treasurer and General Secretary."

H. M. Whelpley moved that the General Secretary be instructed to have one hundred copies of the Report on the Progress of Pharmacy bound in paper, to be placed at the disposal of the Committee on Membership. It was unanimously adopted.

On motion of Chas. E. Dohme, it was agreed to appropriate one hundred dollars for the use of the Committee on Membership.

J. M. Good, on behalf of the special committee, recommends the following necessary changes in the By-Laws for the creation of a new Section of the Association, to be known as the Section on Practical Pharmacy and Dispensing.

In line 1 of Article II. Chapter VI., strike out the words "twenty-one," and insert in place thereof the words "twenty-two."

In line 1 of Article II. Chapter VIII., insert the word "four" in place of the word "three." In line 3. after the word "interests," insert "3. Section on Practical Pharmacy and Dispensing," and change the present figure "3" in the line to "4."

Change Article VI., Chapter VIII., to Article VII., and insert a new Article VI., to read as follows: "The fourth session shall be devoted to the subject of Practical Pharmacy and Dispensing."

Change the present Articles VII., VIII., IX., X., XI, XII., XIII., XIV., XV., XVI., of Chapter VIII., to Articles IX., X., XI., XII., XIII., XIV., XV., XVI., XVII.

Amend the new Article VII., Chapter VIII., by striking out the words "fourth, fifth and sixth," and inserting in place thereof the words "fifth, sixth and seventh."

In the new Article VIII., Chapter VIII., strike out the word "seventh" in the first line.

In line 1, Article I., Chapter IX., strike out the word "seven," and insert fhe word "eight" in place thereof, and in line 3 insert after the word "Pharmacopœia" the words "a Committee on Practical Pharmacy and Dispensing."

Change Articles VII., VIII. and IX. of Chapter IX. to Articles VIII., IX. and X., and insert a new Article VII. to read as follows: The Committee on Practical Pharmacy and Dispensing shall be elected by the Section on Practical Pharmacy and Dispensing. It shall arrange in advance the business to come before the Section at the next annual meeting. It shall propose a series of subjects for general discussion, and solicit papers on subjects pertaining to the actual practice of pharmacy in retail stores.

On motion of C. Lewis Diehl, duly seconded, the Committee's report was adopted.

S. A. D. Sheppard moved, seconded by G. W. Kennedy, that such a sum of money as may be necessary, not to exceed fifty dollars, be and is hereby appropriated to defray the expenses of a special committee of the Section on Education and Legislation on the proposed model pharmacy law. This was adopted.

On motion of Chas. E. Dohme, the Council agreed to recommend to the Committee on Programme that they arrange for simultaneous meetings of the Sections on Commercial Interests and Scientific Papers.

On motion, the Council adjourned.

GEO. W. KENNEDY, *Secretary.*

THE PRESIDENT: Are there any corrections of these minutes of the Council? If not, the question is upon their adoption.

MR. HALLBERG: Did I understand the Secretary to report that the Scientific and Commercial Sections are to meet simultaneously?

THE PRESIDENT: It was carried as a recommendation only—not a mandatory requirement.

MR. ALPERS: I move that we disapprove of this proposition, or recommendation, as to the simultaneous meeting of these two Sections on Scientific Papers and Commercial Interests.

Mr. Stewart seconded the motion.

After some discussion by Messrs. Dohme, Alpers, Stedem and Lowe, the motion to strike out was put and carried.

Mr. Kennedy moved the adoption of the minutes as read, with the exception indicated. Mr. Lowe seconded the motion, and it prevailed.

Mr. Kennedy read a list of three additional names for membership proposed by the Council, making 123 in all.

On motion of Mr. Whelpley, these gentlemen were invited to complete their membership.

On motion, the Association adjourned, to meet at 3 o'clock this afternoon.

ELEVENTH SESSION—SATURDAY AFTERNOON, MAY 12, 1900.

The Association was called to order at 3:15 p. m. by President Prescott, who stated that the first order of business was the reading of the minutes by the Secretary.

The Secretary thereupon read the minutes of the second general session, as also the special sessions of Friday and Saturday mornings.

On motion of Mr. Seabury, the minutes were ordered approved as read.

THE SECRETARY: Mr. President, some action as to the election of officers for the new Section is necessary—the Section on Practical Pharmacy and Dispensing. The amendment to the By-laws establishing this Section was adopted at the special session held on Friday morning. The next thing, therefore, is the election of officers.

MR. SHEPPARD: As this new Section has not yet come into existence, and cannot elect

its own officers, it is necessary for the Association to do so. I therefore nominate Mr. Henry P. Hynson, of Baltimore, for Chairman, and Mr. F. W. E. Stedem, of Philadelphia, for Secretary; and I also nominate Mr. C. Lewis Diehl, of Louisville, as their associate on the Committee.

The President stated that if there were no other nominations, the nominations would be closed.

Mr. Ryan moved that the General Secretary be instructed to cast the affirmative ballot of the Association electing the three nominees, which motion was seconded by Mr. Thompson and carried.

The Secretary announced that he had performed the duty assigned him.

Mr. Whelpley: This action causes a vacancy in the Council, as Mr. Hynson was a member of the Council; and I place in nomination to fill that vacancy Mr. W. C. Alpers, of New York, and move that the Secretary be directed to cast the affirmative ballot of the Association electing that gentleman accordingly.

The motion was seconded by Mr. Seabury and carried.

The Secretary stated that he had obeyed instructions.

The President: The report of the Committee on General Prizes, which was deferred at the second session because not completed, is now in order.

The Secretary read the report as follows:

REPORT OF THE COMMITTEE ON GENERAL PRIZES.

The Committee on General Prizes beg leave to recommend that the several prizes provided for by the Association for papers submitted at the meeting held at Put-in-Bay, Ohio, September, 1899, be awarded as follows:

First Prize—To A. B. Prescott and H. M. Gordin, for their paper entitled "Directions for Certain Alkaloidal Assays."

Second Prize—To Edw. Kremers and Oswald Schreiner, for their paper entitled "Nitroso Derivatives of Caryophyllene and Cadinene, etc."

Third Prize—To Henry Kraemer, for his paper entitled "The Valuation of Vegetable Drugs and Foods."

HERMAN HAGER PRIZE.

Not awarded.

JOHN M. MAISCH PRIZE.

To J. O. Schlotterbeck and A. Van Zwaluwenburg, for their paper entitled "The Developmental History of Important Seeds."

W. M. Searby, *Chairman.*
E. R. Miller,
E. A. Ruddiman.

Mr. Thompson, seconded by Mr. Dohme, moved to receive and adopt as read. Carried.

The President: The report of the Committee on President's Address is the next order of business.

Mr. Thompson read the report as follows:

REPORT OF THE COMMITTEE ON PRESIDENT'S ADDRESS.

Your Committee reports a careful consideration of the thoughtfully written, able address of President Prescott, and commends it to the earnest study of all our members.

Departmental ideas so clearly set forth by him, involving as it does an economy of effort, and at the same time the more uniform combination of the several divisions of pharmaceutical practice, offers this Association a policy which your Committee thinks should be seriously considered, with the object in view of putting all departments upon an actual level without favor or disparagement to any, since they are equally dependent one upon the other.

Following the request of the President, we suggest some movement of the Association whereby "Pharmacists become the constituents of this organization in numbers to make it widely representative." We submit that the action of the Council recommending a Section of "Practical Pharmacy and Dispensing" is a movement in that direction, and in the arrangement of future programmes we suggest that more time be allotted to the discussion of such topics as are directly interesting to the larger percentage of our members.

We urge the Association to take active steps to bring the value of its published proceedings as a book of reference more prominently to the attention of the pharmacists at large, and suggest that the Council consider the propriety of publishing the Report on Progress of Pharmacy in pamphlet form, to be used as a help in soliciting new members.

We recommend that the Council be instructed to make a more active campaign towards adding new members to our Association, and as an aid thereto, the Association for the next four or five years hold its annual meeting in the more central and populous part of this country.

Respectfully submitted,

LEWIS C. HOPP,
W. S. THOMPSON,
HY. P. HYNSON.

THE SECRETARY: You have heard the report of the Committee on President's Address. What will you do with it?

Mr. Remington seconded by Mr. Dohme, moved its adoption. Carried.

The President called for the Report of the Committee on Welfare of the Association, and Mr. Remington, Chairman, read the report as follows:

REPORT OF THE COMMITTEE ON FUTURE WELFARE OF THE ASSOCIATION.

Your Committee specially appointed to consider the future welfare of this Association beg leave to report that they have carefully weighed the various propositions brought before them and herewith submit the following for your consideration:

It must have been apparent to every member of this body that we have not of late been growing as we should; it would be unsafe to hazard a surmise as to the reason for this, for the truth is probably that no one reason can be given, but that a combination of causes has led to the present situation; at any rate, the disagreeable facts must be faced bravely and a remedy found.

The Proceedings are certainly valuable and reflect great credit upon the Association, but it might be found possible to reduce the cost by directing the General Secretary to

prune down the notes of the talks of the members, and omit the verbiage which would otherwise cumber the book.

A glance at our meetings always shows that the "Old Guard" are faithful, and were it not for these how could we exist? But every Association requires for healthy growth "new blood," and your Committee are convinced that this is the condition which, more than any other, calls for prompt action. A large number of our members do not attend the meetings, and nearly all who are present are those prominent in cities, large towns, universities and colleges; and whilst such represent moving forces in the community and are indispensable, the members from smaller places are no longer largely in evidence. It is plain that the deliberations of the various Sections and of the Convention do not claim their presence, in view of the fact that these members can now stay at home and read the very full and excellent reports of the doings of the body in the pharmaceutical journals, or later in the Proceedings, and they prefer to think that they cannot afford to take the long trips to the Association meetings.

One of the features of our meetings which contributed largely to the substantial upbuilding of the membership in former years was the holding of an exhibition coincident with the time of meeting. These exhibitions were discontinued largely on account of some abuses which had crept in, and it was doubtless excellent judgment at the time to drop them; but experience has shown that a good deal of value was sacrificed by this action, and your Committee believe that with this intermission of several years, and with a radical change of method and the adoption of new features, the holding of the meeting in St. Louis and a hearty desire on the part of all members to co-operate with the Committee in charge, that we shall promote the welfare of this Association in a marked degree. If members generally can feel after the meeting in St. Louis that they have acquired some practical knowledge, seen some appliances, apparatus, goods, or can make use of some knowledge that has come to them, they certainly will not only feel that it was a profitable outlay for them to go to the meeting, but they will spread the news thereafter and get their friends to join them in the future; the indirect effect of this would unquestionably contribute favorably to our welfare.

Your Committee present the following resolution:

Resolved, That this Association hold in 1901, in the City of St. Louis, an exhibition of objects of interest to pharmacists.

Resolved, That a special committee of three be appointed, of which the Local Secretary shall be a member, who shall have charge of this exhibition, and who shall report to the Council from time to time, in order to carry out the work properly.

The action of the Council at this meeting in Richmond, in conferring upon the Chairman of the Committee on Membership authority to designate local agents will, we trust, add largely to the membership, and thus contribute to our welfare. The reduced finances of the Association at this time, whilst not in a precarious condition, point clearly to the fact that the outgo is greater than the income, and if this is not remedied permanent injury will result; is it not wise to recognize promptly the consequence of such a condition if continued, and provide a remedy?

Your Committee, after due consideration, believe that upon the present basis of income the Association cannot safely expend more than $2,000 for salaries to the paid officers; and whilst regretting the conditions which necessitate such a recommendation, for they unanimously bear testimony to the faithful performance of the work of the officers, they believe that for the next year this sum should not be exceeded.

Respectfully submitted,

JOSEPH P. REMINGTON,
W. S. THOMPSON,
H. M. WHELPEY,
WILLIAM C. ALPERS,
A. E. EBERT.

Mr. Seabury, seconded by Mr. Maisch, moved to accept the report.

MR. RYAN: I believe the report provides for an exhibition to be held, and calls for the appointment of a committee to take charge of the arrangements for this exhibition, and I believe it also provides that the Local Secretary be one member of the committee. I move, then, that this committee be appointed, and that Mr. Remington be made Chairman of the committee to arrange for this exhibition.

Mr. Whelpley seconded the motion.

MR. THOMPSON: I suggest that the mover of this motion amend it so as to authorize the Council to appoint the remaining member of the committee, which is a committee of three. Mr. Remington is now recommended, and Mr. Whelpley, and I think the remaining member should be appointed by the Council.

MR. RYAN: I will accept that as an amendment.

THE PRESIDENT: The motion as amended is, that a committee of three be appointed, of which Mr. Remington is to be Chairman and the Local Secretary a member, the the third member to be appointed by the Council, to take charge of the arrangements for the proposed exhibition at Saint Louis in 1901.

MR. HALLBERG: I would like to know if this committee is going to have any rules to exclude preparations which are not, from our standpoint, ethical. If this exhibition is going to be one of a great lot of all sorts of nondescript mixtures, I will certainly oppose it. The reason this feature—which was a very proper one in itself, perhaps—was eliminated from the meetings of recent years was because the exhibitors abused the privilege, and preparations of all sorts were exhibited. If the committee will, even by a sign, indicate that this exhibition is going to be confined to what we regard as legitimate products, I will be satisfied.

MR. SEABURY: I believe that this committee which you will appoint will remove all alien products, and rule that they must be strictly pharmaceutical, and in direct line with pharmaceutical procedure, and that no other exhibit will be permitted there. I think that is what my friend is aiming at, and I believe in that myself.

MR. WHELPLEY: On behalf of the Committee, I will say that I think the sentiment of the members already selected is certainly fully in accord with the avowed purpose of this Association, and Mr. Hallberg and all other members may rest assured that every effort will be made to have this exhibition one that will do honor to the Association and of interest to every member.

The motion as stated by the Chair was then put and carried.

THE PRESIDENT: The Secretary calls my attention to the fact that we need further action in carrying out the Report of the Committee on Welfare of the Association already adopted, in respect to this clause:

"Your Committee, after due consideration, believe that upon the present basis of income the Association cannot safely expend more than $2,000 in salaries to the paid officers, and while regretting the conditions which necessitate such a recommendation, for they unanimously bear testimony to the faithful performance of the work of the officers, they believe that for the next year this sum should not be exceeded."

The question arises upon the adoption of this resolution, or something to that effect.

MR. REMINGTON: The Committee feel that that should be left to the decision of the

Council. The Committee was thoroughly impersonal, looking at the matter merely from the standpoint of the welfare of the Association. It felt that the Council was the body to which all such questions should be relegated, and I make that as a motion.

The motion was seconded by Mr. Hallberg.

MR. RYAN: Is it not a provision of the By-Laws of the Association that certain salaries shall be paid to the officers? If that is so, the only regular way of acting upon this is to propose the necessary amendments at this session, and then adjourn for a minute or two to act on them at the next session. I make that motion, that we adjourn for one minute, and take up this matter at the next session.

THE SECRETARY: The By Laws fix the compensation of the several paid officers, four in number. If the mover of the resolution will permit me to suggest, he should propose the necessary changes in the By-Laws before we adjourn. There are five articles to be amended.

MR. HALLBERG: I suggest that the Secretary state the amount of the salary paid to each officer.

MR. RYAN: There is trouble here for the meeting, because there are five different By-Laws to be amended.

MR. DOHME: I believe this resolution is unnecessary in the present state of our finances. We are confronted by a little deficit that occurred by having practically two meetings and some extraordinary expenditures in the past year, and not making use of the funds in the hands of the Association, which are held back and invested in a general fund, and which could have been used for our expenditures. I think our membership will increase in a year or two, and I do not think we should be in too much of a hurry to reduce salaries for work that is already not well enough paid for. I believe we should hold off for a little while. It is not necessary now, and I think it would be better to let this lie over for a year or two. The Association will not suffer by it.

MR. REMINGTON: In view of the remarks of Mr. Dohme, who is Chairman of the Finance Committee, I am perfectly willing that we should adopt the report, with the words at the last, "for the next year" stricken out, and let it go to the Council for future action.

The President requested the Secretary to read again that section of the report bearing upon the proposition to reduce the allowance for salaries, and he did so.

MR. REMINGTON: I move that we strike out the words "for the next year," so as to leave the matter open.

Mr. Ryan, seconded by Mr. Seabury, moved to adopt the report as amended. Carried.

The President called for the report of the Transportation Committee as the next order of business, and Chas. Caspari, Jr., Chairman, read the report as follows:

REPORT OF THE COMMITTEE ON TRANSPORTATION.

Mr. President and Members of the American Pharmaceutical Association:

As early as December, 1899, application was made to the various traffic associations for

reduced rates on account of the forty-eighth annual meeting; but as under the rules of some of the railroad companies sueh applications cannot be considered earlier than 90 or 60 days from date of the proposed meeting, definite replies from the leading passenger associations were not received until February and March. A rate of one and one-third fares, on the certificate plan, for the round trip, has been secured from the leading railroad companies, the New England and Western Associations however, flatly refusing to make any reductions. In order to enable members who might desire to attend both the Washington Convention and the Richmond Meeting to do so at least possible expense, repeated efforts were made to induce the railroad companies to grant advance selling dates for the tickets to Richmond (April 28th or 30th) so that holders of such tickets could stop off at Washington for 3 or 4 days by depositing their tickets with the railroad company during their stay in the latter city. All efforts were met by refusal except in the case of the S. E. Passenger Association, who agreed to put tickets to Richmond on sale in their territory from April 28th to May 9th; by this action our southern and southwestern members alone have secured the benefit which was desired for the whole Association. The Committee of Arrangements for the Washington Convention, Dr. M. G. Motter, Secretary, made efforts along somewhat similar lines, by applying for an extension of the life of the Washington tickets, so as to cover the time of the Richmond meeting; such extension if secured would have afforded the same relief as sought by your committee. It was not until April 24, however, a week after the General Secretary's circular had been mailed to the members, that the Trunk Line Association finally consented to extend the Washington certificates to May 15.

The 50,000 slips authorized by the Association at its last annual meeting, and which it was expected would insure increased interest and attendance at this gathering, were printed at an expense of $26.96, and were kindly distributed throughout the country by the wholesale druggists and manufacturers of the various sections. Grateful acknowledgements are hereby made to the numerous firms for prompt and courteous response to our request for such distribution.

For the Committee, CHAS. CASPARI, JR., *Chairman.*

Mr. Ryan, seconded by Mr. Stewart, moved that the report be accepted.

MR. SHEPPARD: As a member of that committee for New England, I want to say I think we are in a peculiar position there. We are bottled up. Of course, from New New England to the West or South, we go through New York, and one road controls all the lines between Boston and New York—the New York and New Haven—and they will not give rates unless we can guarantee fifty members. It is hard on us, but I see no help for it.

Mr. Ryan's motion to accept was carried.

The report of the Delegates to the Convention for revising the United States Pharmacopœia having been called for, Mr. W. S. Thompson, Chairman, read the following report, which, on motion, was accepted and referred to the Committee on Publication:

REPORT OF THE DELEGATES TO THE PHARMACOPŒIAL CONVENTION.

To the American Pharmaceutical Association: Your Delegates to the Eighth Decennial Convention for revising the United States Pharmacopœia, beg to state that they attended on said Convention at the City of Washington, D. C., May 2, 3, and 4, 1900.

The Convention having voted to present a printed copy of its transactions to each of its constituent bodies, excuses any mention of the work in this report.

We submit for the information of the Association a copy of the recommendations we

made to the Convention touching the policy to be pursued by the Committee of Revision. In these recommendations your delegates endeavored to express what they believed to be the sense of the Association on each topic.

WASHINGTON, D. C., *May* 2, 1900.

To the Eighth Decennial Convention for revising the U. S. Pharmacopœia.

Gentlemen: As delegates from the American Pharmaceutical Association, the undersigned beg to submit the following suggestions as to the next revision of the Pharmacopœia:

Dosage.—We would strongly urge the introduction of doses, both on account of their usefulness to the physician, and great convenience to the pharmacist. A table of maximum doses of the more potent remedies would be a desideratum for the pharmacist. The method used in the latest British Pharmacopœia of giving the dose in the index, as well as the text, commends itself to our judgment.

Standardization of Drugs.—We favor the standardization of all the potent drugs whose chemistry is well enough known to fix and determine their active principles by processes of assay not beyond the skill and means of the fairly-well equipped retail pharmacist.

Patented Synthetics.—Such of these substances as have established medicinal value, and are of such definite composition as to be subjects of test of identity and purity, could, with advantage, be admitted. We take the liberty of naming: Phenacetin, Sulfonal, Antipyrine, Trional, Saccharine, Orthoform and perhaps others.

Scope.—The great object of a Pharmacopœia being to secure uniformity in the composition of medicines, we believe the scope of ours might be wisely extended so as to embrace more of the remedies in daily use by the physician. Many of the popular elixirs and other preparations of the National Formulary might be transferred to the Pharmacopœia, thus securing uniformity in dispensing without obliging the physician to designate the product of some particular maker in order to get definite results.

Legal Standard.—As our Pharmacopœia is being made the lawful standard of purity in many of the States, we would recommend that care be taken not to fix the standard of purity unnecessarily high, especially when it is only to be attained at considerable expense. And some conservative allowance should be made for preparations that rapidly deteriorate. We recommend these concessions to the commercial conditions only when the concessions can be made without impairment of the medicinal uses of the substances.

Price.—We believe it prudent to maintain a surplus sufficient to cover any ordinary emergency, and the outlay required before the book can be offered for sale. After this is accomplished, the price should be made to cover only the necessary cost of production.

Royalty.—The dispensatories and other text-books using the text of the Pharmacopœia should pay a fair compensation.

Respectfully submitted,

W. S. THOMPSON,
ALFRED R. L. DOHME,
LEO ELIEL.

The President called for the Report of the Committee on Status of Pharmacists in Government Employ, and Mr. Payne, Chairman, read the report as follows:

REPORT OF SPECIAL COMMITTEE ON THE STATUS OF PHARMACISTS IN THE ARMY, NAVY AND MARINE HOSPITAL SERVICE OF THE UNITED STATES.

Fellow Members of the American Pharmaceutical Association:

The steady progress which has been made by our Committee since its first inception

has no doubt been a source of great satisfaction to this Association. The success which we have achieved has been largely due to the splendid co-operation of the great majority of this Association as leaders in the movement. In every State the members of the American Pharmaceutical Association have been leaders around whom the pharmacists of their respective States have rallied. In each State has been secured the hearty assistance of nearly every pharmacist in the advancement of the work of our Committee. To our fellow members of this Association we tender our heartfelt thanks for their splendid support, which steadily becomes more and more active and enthusiastic. We are deeply grateful to the pharmacists throughout the various States who are not members of our Association, but who have acted with us with such hearty co operation. We scarcely know how to thank the pharmaceutical press for their deep interest in our work and for their prompt readiness to push and advance our cause on every possible occasion. Some of these publications have not confined themselves to editorial work alone, but have been most active in keeping our Committee posted in regard to matters and movements requiring our immediate attention. Since the last meeting of the Association, eight months ago, we have had interviews with the Surgeon-Generals of the Army, Navy and Marine Hospital Service. In the navy, where we have already secured so considerable an advance, we met with much encouragement as to still further recognition. The Naval Department does not object to the title of pharmacist nor to an increase of salary. The Surgeon-General of the Army stated to us only last week that he was in favor of and would recommend an increase of the salaries of the hospital stewards, but that he was not in favor of giving them the title of pharmacist. He states that he does not consider the hospital steward as being a pharmacist alone, that he has other duties, and the title would be inappropriate. He suggested the name of Hospital Sergeant. Pharmacists are not satisfied with the term hospital steward, which smacks of the culinary department too strongly, nor would they be satisfied with the term hospital sergeant. They desire the title of pharmacist and a fair salary. The position of hospital steward offers no hope of advancement. What a pitiful recompense for faithful service in pharmaceutical work for a long term of years in the Government employ, to look forward to an achievement of only fifty dollars a month and rations! Can any honest Professor in a College of Pharmacy recommend a student to follow such a career, which, at its best, offers so little? Can any well-educated American pharmacist enter such a service unless forced to do so by sheer necessity? The term hospital steward is claimed to suit actual conditions better than that of pharmacist. In the Government service, we are informed, men are drawing pay as hosiptal stewards who are doing only clerical work. There are also said to be men drawing salaries under other titles who are not doing the kind of work their classifications call for. Hence, in some cases, it would seem that the title employed is not necessarily a match for the duties required.

The Government, however, requires each hospital steward to be a pharmacist. The hand-book used by the hospital stewards for their guidance contains the following words as to what is expected: "A trustworthy pharmacist, an efficient disciplinarian, familiarity with materia medica, therapeutics and minor surgery; during the absence of the medical officer the hospital steward is the highest professional authority present." In the recent interview with the Surgeon-General of the Army the cause of the pharmacist was urged upon the grounds that, in addition to compounding, he was needed to locate camps, in regard to proper water supplies, for the examination of foods furnished, general sanitation, urinalysis, etc. Upon the general idea that "An ounce of prevention is worth a pound of cure" the pharmacist's services should be invaluable. To this argument the reply was received that "we educate our surgeons to do this work." Pharmacists are educated in their colleges to do this class of work; most medical colleges pay but little attention to such matters. The surgeons that enter the United States Army have been given a wide range of study in surgery and diagnosis, but in compounding

drugs and in chemical analysis, which relates to the examination of such daily important matters as food and water supplies, they have received usually but little instruction. The medical colleges of to-day are growing wider and wider in their range and accomplishments in the magnificent field of surgery, and diagnosis is assuming more and more scientific accuracy. In the realm of materia medica, therapeutics and chemistry, the pharmacists of to-day are making giant strides. The surgeons write fewer and fewer prescriptions, and order the ready-made combinations of the pharmacist in greater and greater numbers. The manufacturing pharmacists, according to their amount of capital, from the largest concerns to the smallest in our country, push and urge the use of their formulæ, and furnish to the practitioner and surgeon an additional literature which has a success so tremendous as to be almost marvelous. It is claimed that over fifty per cent. of all the prescriptions written in our leading hospitals call for proprietary combinations of the pharmacist. The splendid fields of materia medica and chemistry are furnishing glorious harvests to the pharmaceutical workers. The true pharmacist of to-day is not simply a pill counter nor a huckster of one-dollar patents at sixty-seven cents each, but a professional man, who is fully posted in those branches of materia medica, therapeutics and chemistry, which throw him in closest touch with the surgeon, practitioner and public. He is becoming more and more a seller of his own preparations and those of his brother pharmacists who have better facilities than himself for the production and study of certain preparations.

The great changes that have already occurred and are still steadily taking place around us are scarcely realized by most surgeons or pharmacists. The requisition lists for army medical supplies show a paucity of remedial agents, which is startling when we understand that they are devised to meet the requirements of the diverse ailments of many thousands of men. The wonderful progress of surgery and the marvelous success in the prevention of disease by proper attention to foods, drink and sanitation has no doubt lessened in a great degree the number of cases where medicines are needed. But these very conditions make more and more necessary the presence of skilled pharmacists in the United States Army. The modern pharmacist is becoming more and more a chemist, and the physician less and less of one. The pharmacist of to-day constantly devises and makes successful combinations of remedies to secure certain results, renders them palatable, and furnishes to the physician his prescriptions ready made. Modern pharmacy, with its knowledge of materia medica, therapeutics and chemistry, throws the search-light of accurate analysis upon the drugs used in medical practice, and finding in many cases no substances of medicinal value present, induces the physician to cast aside such worthless materials, and again finding valuable remedial agents present in substances heretofore considered of no value, places in the hand of the physician new weapons against disease. To the busy, successful practitioner of to-day the modern pharmacist is invaluable in many ways beyond the mere mixing of drugs.

Our committee some time ago secured the placing of the Marine Hospital Stewards upon the Civil Service List. This success was much appreciated by the Marine Hospital Stewards, as it removed them from the position of mere clerks, liable to instant discharge, to that of some fixed status. During the past year a very active effort was made to have them removed from the civil service list, and again become political foot-balls. This effort was met by our committee by presenting the matter in the proper light to both the President and the Civil Service Commission. The wishes of the pharmacists of the United States were respected, and the Marine Hospital Stewards were retained on the civil service list.

We have had an interview in the past few days with the Surgeon-General of the Marine Hospital Service. He strongly intimated that he would accord the title of pharmacist and increased pay to the Marine Hospital Stewards in regulations which he will soon prepare.

Just before the declaration of war with Spain our Committee had taken preliminary steps toward unity of action of the hospital stewards in the National Guard of each State in the Union, in regard to the proper recognition of pharmacists as commissioned officers. Considerable progress was made, but the breaking out of hostilities caused such changed conditions in every State that it was deemed advisable to wait until the reorganization of the National Guard in each State, which was almost sure to take place. The first State to take up the matter after the declaration of peace was the Empire State of New York. The pharmacists of the whole State entered most actively into the work. A bill was prepared giving a pharmacist to each regiment, with the rank of first lieutenant.

The bill passed both Houses of the Assembly, and received the Governor's signature on May the second. The work of the leading pharmacists has our warmest thanks and praise. We would mention by name some of those who did such magnificent work, but by so doing we would be sure to leave out some of the most deserving, for where so many are actively at work it is impossible to keep informed as to each valuable service.

The following letter was received from New York a few days ago:

NEW YORK, *May 7, 1900.*

MR. GEORGE F. PAYNE, *care of The Jefferson, Richmond, Va.:*

Dear Sir: In behalf of our Association, I beg to tender to you our sincere thanks for your hearty support in our recent battle. We feel that in a great measure our success has been due largely to your efforts, who have labored so arduously to advance the status of the Hospital Steward. We sincerely hope that the American Pharmaceutical Association now in session will adopt such means as they see fit to bring about the same in the regular army.

Our Association will keep in touch with you from time to time, and will be only too glad to render you any assistance in this work that is within our power.

Very respectfully, (Signed) W. G. TUTTLE,
Chairman of the Association of Military and Naval Apothecaries of the State Forces.

During the reception of Admiral Dewey in New York the pharmacists of that city united in doing honor to Mr. Hammar, the newly warranted pharmacist of the flagship Olympia. A splendid banquet and other honors were accorded him. Our committee were invited and strongly urged to be present. The occasion was a memorable one. To secure the respect of the public we must respect ourselves, and such functions are splendid educational factors.

We appeal to the pharmacists of every State in the Union that they secure the passage in their respective States of an act which will accord the title of Pharmacist and the rank of first lieutenant to a pharmacist in every regiment in the National Guard. Such official recognition as this will mean much for the professional status of every pharmacist, and the respect accorded him by the public. A portion of the advancement secured by the work of your Committee is as follows:

In the Army: The elimination from the service of hospital stewards who were aliens and non-citizens of the United States. The promise of the Surgeon-General to recommend an increase of salary for hospital stewards.

In the Marine Hospital Service: The placing of Marine Hospital Stewards upon the Civil Service list. A small increase of salary for the Marine Hospital Stewards. A recent letter from a Marine Hospital Steward states that the work of our Committee has given him $350.00 in increased salary up to date.

In the Navy: General improvement of the status of the hospital steward among the petty officers.

The appointment of 25 pharmacists with the rank of warrant officers, with salaries from $1,200 to $1,800 annually, the former salaries being $720 annually.

In the National Guard: The title of pharmacist and the rank of first lieutenant in the State of New York.

Respectfully submitted, GEORGE F. PAYNE, *Chairman.*

Applause followed the reading of the report.

Mr. Thompson moved that the report be received, and that the thanks of the Association be tendered to Mr. Payne, Chairman, and his associates on the committee, for their very efficient work on behalf of the pharmacists in the employ of the United States Government.

Mr. Remington seconded the motion, and it prevailed.

The PRESIDENT: The best possible thing the Association can do is to continue this committee in the good work they have been doing, and give them our hearty support.

MR. SEABURY: The American Pharmaceutical Association certainly makes a great impression on people who know nothing about pharmacy. (Laughter) There is no question about that. And, therefore, a carefully-worded resolution from this Association going to the medical directors of the Army and Navy would certainly make a great impression on them. That I know, as a matter of fact If you don't ask for what you want, you will never get it. I think that report is incomplete without putting ourselves on record as demanding recognition.

THE PRESIDENT: Will Mr. Seabury accept the suggestion that we empower Mr. Payne to speak for us with the utmost force, and we will back him up — the Association will stand by him ?

MR. SEABURY: Certainly, sir.

And the motion was so put and carried.

Mr. Thompson, Chairman of the Council, at this stage presented his report on the invested funds of the Association, and read the same, as follows:

REPORT OF CHAIRMAN OF COUNCIL ON THE FUNDS OF THE ASSOCIATION.

The investments and cash belonging to the several funds of the Association, in possession of the Chairman of the Council on April 15, 1900, consist of:

EBERT FUND.

1 U. S. Reg. 4 per cent Bond, No. 160,603, for	$100 00	
1 U. S. Reg. 4 per cent. Bond, No. 67,880, for	500 00	
1 U. S. Reg 4 per cent. Bond, No. 2,125, for	100 00	
		$700 00
Cash balance from last report	$62 20	
Received since then	27 84	
	$90 04	
Nov. 7. Paid for Ebert Prize	28 00	
Balance in F. I. T. & S. D. Co., Philadelphia		$62 04

CENTENNIAL FUND.

1 U. S. Reg, 4 per cent. Bond, No. 145,640, for	$1000 00	
1 U. S. Reg. 4 per cent. Bond, No. 160,604, for	100 00	
1 U. S. Reg. 4 per cent. Bond, No, 2,126, for	100 00	
1 U. S. Reg. 4 per cent. Bond, No. 2,127, for	100 00	
		1300 00

Cash balance from last report	$204 05	
Received since then	52 90	
Balance in F. I. T. & S. D. Co., Philadelphia		256 95

LIFE MEMBERSHIP FUND.

11 U. S. Reg. 4 per cent. Bonds, each for $1,000.00 (Nos. 145,639, 145,761, 145,762, 150,826, 150,827, 150,828, 164,185, 164,889, 173,049, 185,893, 202,591)		11000 00
Cash balance from last report	$609 18	
Received since then	528 26	
Balance in F. I. T. & S. D. Co., Philadelphia		1137 44

GENERAL FUND.

6 American Security and Trust Co.'s debenture bonds, each for $500 (Nos. 94, 95, 96, 97, 98, 99)	3000 00

Two of these bonds (Nos. 94 and 95) are held by the American Security and Trust Company as security for loan of $1,000.

The interest on the General Fund is paid to the Treasurer.

All interest paid to date.

Washington, D. C., May, 1900. W. S. THOMPSON, *Chairman of Council.*

THE PRESIDENT: The Secretary has two communications from the Section on Commercial Interests which require our action in general session.

The Secretary then read the following resolution, which had been received and endorsed by the Commercial Section and its passage by the Association at large recommended:

Resolved, that this Association cordially endorse the work of the N. A. R. D. and the plan proposed by their Executive Committee to lessen the evil of price-cutting on proprietary medicines.

On motion of Mr. Anderson, duly seconded, the resolution was adopted as read.

The Secretary read a second resolution from the same Section as follows:

WHEREAS, There is a growing surplus in the Treasury of the United States; and

Whereas, That portion of the stamp tax law known as Schedule B operates most unfairly, imposing, as it does, an income tax equal in the case of the retail druggist to some 30 per cent. of the income derived by him from the sale of proprietary preparations; therefore

Be it resolved by the Commercial Section of the American Pharmaceutical Association, that the Congress of the United States be, and is hereby, petitioned to repeal Schedule B of the revenue bill.

Mr. Mayo moved that the Association in general session approve the resolution as read, and instruct the Secretary to forward a copy to the Internal Revenue Commissioner and to the Chairman of the Committee on Ways and Means of the House of Representatives.

Mr. Anderson seconded the motion and it prevailed.

THE SECRETARY: I believe we are also to have a communication from the Section on

Education and Legislation. I have not received it, but I understood we were to have one.

MR. LOWE: The Secretary of the Section, Mr. Koch, has just gone downstairs to write it out. The sense of it is this: A delegation of the Chamber of Commerce of Richmond appeared before us this morning to speak on the Brosius Bill, and the amendment they proposed was agreed to by the Section.

THE PRESIDENT: We have some communications here from manufacturing chemists with reference to the use of the metric system.

THE SECRETARY: I think it wise to bring this matter before you now, that you may know the result of my efforts to carry out the Association's instructions. The Secretary sent out 234 letters under the resolution of last year. I am sorry to say that he received but three replies, and all three unfavorable, I have thought it proper to bring up the matter to show that the orders of the Association had been carried out and that the result was not satisfactory.

Mr. Thompson moved that the replies be referred to the Chairman of the Committee on Weights and Measures, and Mr. Seabury seconded the motion.

MR. HALLBERG: I would like to have the names of the three firms read. I think we are entitled to know who was sufficiently interested to reply to the communication of the Secretary.

THE SECRETARY: They are the well-known houses of Searle & Hereth Company, of Chicago; William S. Merrell Chemical Co., of Cincinnati, and Hance Bros. & White, Philadelphia.

Mr. Thompson's motion was put and carried.

Mr. Koch, having returned, read the amendment to Section 7 of the Brosius Bill, proposed by the Chamber of Commerce of Richmond, and also the resolution adopted by the Section on Education and Legislation, recommending endorsement by the Association at large of the amendment offered.*

MR. THOMPSON: Mr. President, I beg to call attention to the fact that this Association was represented by a delegation at the Pure Food and Drug Congress which formulated the Brosius Bill. This bill was thoroughly discussed by the Congress, and the Brosius Bill is now before the House, and is the result of the combined action of all the various interests. Every interest was represented there, and had its say in the make-up of this bill. It received finally the unanimous sanction of all the delegates present. Now, while this amendment may be a small thing in its provisions, it is fundamental in its effects. It would absolutely destroy the whole effect of the Brosius Bill; and inasmuch as this Association has already taken its position in this congress, I think it is improper now for us as an organization to undertake to have independent action upon the bill, which we have already approved through our delegates. I therefore raise the point of order that this matter cannot now be properly brought before the Association. We are committed to the action of the Congress.

THE PRESIDENT: Mr. Thompson raises the point of order that the action of the var-

* The resolution and proposed amendment may be found in the minutes of the third session of the Section on Education and Legislation.

ious delegate bodies has been consummated in the Pure Food Congress, and has passed beyond the control of these bodies: that we have here the report of our delegates as to what they have done, and it will not be possible to do anything now.

On motion of Mr. Alpers, seconded by Mr. Thompson, this whole matter was then laid on the table by a vote of 16 to 8.

THE PRESIDENT: The Treasurer has a communication from an old member living in a far-distant land that he wishes to call your attention to.

MR. SHEPPARD: I have here a communication from Mr. Samuel L. Rumsey, of Honolulu, that I received this morning, expressing his good wishes for the success of the Association, and his regret that the great distance he lives from us prevents his being with us in person as well as in spirit. He is an old member of nearly thirty years' standing, and has for many years been our only representative in those far-away islands of the Pacific. He says he still hopes to be with us at some future meeting of the Association.

MR. RYAN: Mr. President, I want to move that we rescind the action of the Scientific Section in regard to the paper read by Mr. Williams. I believe we took this action under a misapprehension. The paper Mr. Williams presented to the Association contains letters and statements from one hundred and fifty of our members—members who are seldom heard in its meetings. To publish this paper in full will give these men an opportunity to see their names in the Proceedings of the Association, and will make them feel that they are a part of the Association. The principal objection was the expense and the taking up of space in the Report of Proceedings at this meeting. The expense has already been incurred. The money has been spent, the paper is in type, and the only additional expense we will have is the cost of a few pounds of paper; and I certainly think it will be policy for that paper to appear in the Proceedings in full. If it is to be abstracted, it had better be left out entirely. I move that the paper be published in full.

THE SECRETARY: The whole matter is in type, as the reprint shows. Inasmuch as we have gone to the expense of setting it up, the composition, practically, is paid for. It would involve an extra cost to set up a synopsis, which may or may not be of value. I will leave that an open question. So from the standpoint of economy alone it would be better to publish the whole paper. The increased cost will come from the introduction of a synopsis. Moreover, a report of this kind, in answer to a query, is not very easily abstracted. It is largely a *resumé* of the views of 150 members of our Association, and 40 members of the American Medical Association. I heartily second Mr. Ryan's motion.

Mr. Ryan's motion was then put to a vote and carried.

Mr. Sheppard moved the following:

That the Local Secretary for the meeting of 1901 be chairman of the Committee of Arrangements for that meeting, with instructions to appoint the other members of that committee, and to report their names to the General Secretary for publication in the Proceedings.

The motion was seconded by Mr. Dohme, and carried.

Mr. Sheppard also moved the following:

That the present Local Secretary, Mr. T. A. Miller, be authorized and instructed in the absence of the President and Vice-Presidents to have charge of and preside at the

twelfth or social session, immediately to follow the close of this eleventh session—and on the adjournment of the same to notify the General Secretary of such action.

Mr. Mayo seconded the motion, and it prevailed.

THE SECRETARY: I think we are now ready for the installation of officers.

MR. HALLBERG: If there is no routine business I would like to call attention to one of the permanent committees. It is a committee that has been carried on the leaves of the report for several years, and I am the alleged chairman of it. I mean the Committee on Beneficiary Features. I would like to have that stricken out. The committee made its report two or three years ago, and asked to be discharged, and nothing has been done in the matter since. I do not think it should be carried there any longer.

Mr. Mayo, seconded by Mr. Whelpley, moved that the committee be discharged, and the name of committee taken out of the list of our committees. Carried.

THE PRESIDENT: The time has now arrived when we transfer the responsibility of official control of this Association to the officers for the coming year. As pleasant as this meeting has been here in Richmond, as much as we may regret to have it come to a close, it is certainly a great satisfaction that we extend this welcome before we go, to the new officers for the ensuing year.

The Chair appoints Messrs. Remington and Thompson to escort the President and Vice-Presidents to the chair, and to introduce them to the membership of the Association. It may seem very unnecessary—quite absurd—to introduce them as members, to introduce them as individuals, as well as they are known to us, but we desire the privilege of introduction to them as officers for the next year.

The gentlemen designated escorted Mr. Patton, the President-elect, to the chair, and Mr. Remington said:

Gentlemen of the American Pharmaceutical Association: It is a pleasant duty to introduce to you Mr. John F. Patton, of York, Pennsylvania, one of our oldest members—one who has always been faithful to every duty that this Association has laid upon him, and yet when this highest office in the gift of the Association has been offered to him, he shrinks from it. But it is the universal demand of his friends, the members of the Association, that he should accept the office, and I am sure we will always show him the greatest consideration, and do everything in our power to make his administration the success that yours has been, Mr. President. [Applause.]

THE PRESIDENT: Mr. Patton, President of the American Pharmaceutical Association, it gives me great pleasure to extend a welcome to you at this time, and to extend congratulations upon your election to this office. Nothing more need be said regarding your installation in this office; nothing more need be said as to your selection for it, than that it is the choice—the first and only choice—of this Association, whose members have known you for many, very many, years, and have known you very intimately as one always present in the Association meetings. We have, my friends, various objects for organizations, and various benefits to be derived from them. For all these objects and purposes we have had your support, Mr. Patton. There is no object or purpose more worthy in any association than that of fellowship, fraternity and friendship, and that the membership of this Association, which has known you so well, has selected you for the office of President is indeed an honor, and one that we congratulate you upon. Permit me to present to you this gavel as the symbol of your office as presiding officer, and also

deliver to you this badge as President of the Association, which you will wear as a token of the respect, regard and confidence of your friends, the entire membership of this Association. [Continued applause.]

MR. PATTON: My friends, I can scarcely find words proper to express my appreciation of the high honor you have conferred upon me. I have never aspired to the place, or desired the responsibility, but it is not for me to decide this. I must defer to your judgment. I hope you will excuse me from making any extended remarks, for I have been quite sick in the last day or two, and I find that pain is not conducive to glibness of tongue. Gentlemen, I thank you again. [Applause.]

The committee escorted Mr. Beal forward, and Mr. Remington said:

Mr. President, we have the honor to present to you one of our younger members, but one who has certainly earned by his services to this Association the honor which is about to be conferred upon him. We all know that when Mr. Beal has been selected to perform a duty it will be well done, and we have had the evidence of that at this meeting in the draft of a model pharmacy law that he has presented. I am sure the Association honors itself in electing him to the office of Vice-President. [Applause.]

THE PRESIDENT: In welcoming you to this office, I extend to you the heartiest greetings and good wishes of all your fellow-members, who have known you so well in your services in the Sections of the Association. If in this world's goods you should desire greater prosperity and emoluments at any time, I can only desire that you might receive full legal fees for all the legal services, with interest thereupon, which year after year you have rendered to this Association. We bid you welcome.

MR. BEAL: Mr. President, Ladies and Gentlemen: After listening to the eulogistic words of Mr. Remington and our distinguished President, my beloved former preceptor and instructor, I think I know something of what it is for a man to hear his own obsequies. I am afraid I am somewhat in the mind of Mark Twain, who, upon bring reported to be dead, telegraphed back to his friends, "The report of my death has been greatly exaggerated." [Laughter.] So I feel in this case, that the exordium has been beyond that which would have been justified by the circumstances in the case.

I know it seems improbable when a man from the "Buckeye" State says that he is not desirous of an office; and yet, I trust you will believe me when I say I believe there are many in this Association who could have filled this office with a great deal more propriety than the person upon whom you have bestowed the honor; and especially in this particular year, it seems to me, the entire corps of vice-presidents should have been from among the fairer members of the Association. [Laughter and applause.] However, as the principal duties of the Vice-President are to keep still and look handsome, and as those are my strong points [laughter], I will endeavor to fill the position to the best of my ability. [Applause.]

MR. REMINGTON: I believe the other Vice-Presidents are not present, so we shall not have the honor of presenting them.

THE PRESIDENT: I will announce that Mr. John W. Gayle, of Frankfort, Kentucky, has been elected Second Vice-President, and his election is now declared, and that Mr. E. A. Ruddiman, of Nashville, Tennessee, has been elected Third Vice-President, and his election is now declared. We have not a very large membership from Tennessee and Kentucy, and we hope to see it increase.

MR. REMINGTON: We are very sorry we are compelled to suspend our functions because of the exceeding modesty of the General Secretary and Treasurer.

THE PRESIDENT: I will announce the election of Charles Caspari, Jr., as General Secretary [applause], and that of Samuel A. D. Sheppard as Treasurer. [Applause.] There are some offices which are necessarily permanent offices in the Association, and the Association is especially to be congratulated upon the stability of its organization, the continuity of its work and its responsibility, and we have always great pleasure in learning of the re-election of these officers.

Mr. C. Lewis Diehl, of Louisville, Kentucky, the Reporter on the Progress of Pharmacy, who has done an editorial service which has been going on for a long, long time, and which is a very vital work to this Association, has been re-elected for another year of service. The American Pharmaceutical Association has, indeed, been very happy in this continuous term of service in this very responsible and important duty of reporting upon the progress of pharmacy. [Applause.]

There have been elected as members of the Council Messrs. Baker, Hopp and Alpers, who will serve for the coming year.

Now, fellow-members. the President-elect, Mr. Patton, has requested that I shall keep this place — which I willingly do for obvious reasons — during the remainder of this session.

MR. MAYO: Mr. President and fellow members of the American Pharmaceutical Association, before we leave this beautiful and historic city, where we have learned the true meaning of the term "Virginia hospitality," it is meet that we should make some public acknowledgment of our appreciation of the unfailing courtesy, the universal cordiality and the thoughtful consideration which have made the period of our stay here one long to be remembered in the annals of our organization, and ever to be cherished in the hearts of our members. I therefore move that the thanks of the American Pharmaceutical Association be extended to the citizens and the ladies of Richmond for the better than royal—because more feeling—hospitality which has been extended us; to the Local Secretary and the Committee on Arrangements and Entertainment, and especially to Mrs. T. W. Jeffress, for their untiring efforts to promote the comfort and pleasure of the members.

Coming, as we have, from all sections of this vast country, from the fir-clad hills of Canada on the north to the arid plains of Texas on the south, from Massachusetts' rock-bound coast to California's Pactolian streams, we have been made to feel that Virginia is indeed "the mother of us all." Here, where we meet the Randolphs, the Lees, the Harrisons and the Marshalls, the dry bones of history take on a living flesh and a breathing spirit. The great minds that framed our glorious Constitution and its prototype, the Virginia Bill of Rights, have left their imprint upon the world's history; but here, where these men lived and loved and died, among the descendants who cherish their memories, and maintain almost unchanged their social life, we have been able to comprehend as never before the influences which formed the character of Washington, of Jefferson, of Madison and Monroe, of "Light Horse Harry" Lee and the fiery Randolph of Roanoke. As we stand beside the tombs of Lee and of Stuart, of Stonewall Jackson and the boyish, gallant Pelham, we can appreciate and understand the tender homage paid by a conquered people to their heroic dead.

We can now comprehend that the dry pages of history but serve as a mask to hide the warm hearts which have ever responded promptly and with utter self-abandon to what they considered the call of duty. Whether at Yorktown or at Seven Pines, whether on the "Bon Homme Richard" or on the "Alabama," whether in Independence Hall or in Montgomery, the Virginia gentleman has always borne himself right bravely, being ever in the forefront of battle, ever a leader in the forum and in the field.

In this utilitarian and commercial age it is well that we should find that there is one place where gold is not the measure of the man.

I therefore feel that in moving these resolutions of thanks I am not merely carrying

out a perfunctory motion, but am making glad acknowledgment of a debt we can never hope to pay. For we have received much more than was given us by our hosts; we have gained inspirations for higher, broader lives, for good citizenship, and for a quickened responsibility for our duties to our calling and to our country.

MR. WHELPLEY: I think I echo the sentiment of every member present when I second this motion. Individually as Local Secretary for the meeting at St. Louis next year, I would like to serve notice upon Mr. Mayo that he will be expected to extend the same courtesies there.

MR. LOWE: I move that we take a rising vote, Mr. President.

THE PRESIDENT: Fellow members, I am sure we enter with hearty sympathy into the spirit of this motion, and we would like to say something upon it, but we feel we cannot do the subject justice.

MR. WHELPLEY: It is a glowing tribute to this section of the great United States that we should in so short a period of time twice visit practically the same region—Baltimore and Richmond. It is a tribute that has been recognized by members of the Association throughout the length and breadth of the land, and spoken of more than once by those who are present to-day and those who attended the meeting in Baltimore two years ago, and said that they knew it was their misfortnne that they could not be with us to-day.

MR. ALPERS: As some informal speeches seem to be in order, I want to add my testimony to that of the others who have spoken. Nothing can be added to the glowing historic reminiscences so eloquently expresssd by Mr. Mayo, but I want to say that I believe we have received from the people of Richmond—from the Committee of Entertainment and the people generally, from the Governor down—a hospitality that would not have been extended so cheerfully if they had not been under the influence of the ladies of Richmond [applause], and I wish to emphasize this fact, that a great deal of the success of our meeting, not only in its social aspect, but in the more serious duties before us, has been due largely to the efforts of the ladies of Richmond. Let me recall an historic fact that comes to my mind at the moment: Not far from here, just beyond the limits of this city, is the historic place where a brave Indian maiden saved the life of one of the earliest pioneers of this country. Even though the story of Pocahontas and Capt. Smith may be a legend, as claimed by some, nevertheless it has left a deep impression, it seems to me, upon the womanhood of America, and has inspired it to noble deeds of self-sacrifice which have taught the lesson that the gentle hand of charity and love can often do greater deeds than the bloodiest sword of war. The ladies of Richmond have shown us that they are true descendants in spirit of the brave Pocahontas, and it has been our privilege to be welcomed by them to a cordial hospitality, with a warm grasp of the hand, and to look into their bright eyes sparkling with animation and intelligence. Therefore, gentlemen, I repeat the thanks of this Association are due to the ladies of Richmond, and I make that as a motion. [Applause.]

MR. SHEPPARD: Before we close this little talk I desire to add my testimony to the good time we have had in Richmond. To the ladies and our friends in Virginia I would say, I bring to you the greetings of the old Massachusetts Bay Colony. I think there has always been an especially tender tie between Massachusetts and Virginia, as represented in their historic conditions—we have always seemed to be drawn together. Here, I have had with me two ladies who have reported to me every night the pleasures of the day, and their reports have always been glowing and pleasing. It seems to me that when we come from the North to the South we do get an inspiration that we can get in no other part of the land; and, speaking as a man from the North, I want to say that it is with

feelings of more than ordinary pleasure and enjoyment that we shall go home from this meeting. As I was telling Mrs. Sheppard this morning, I never enjoyed a meeting more, with everybody trying to do that which was for the good of the Association and the happiness of the members. I agree with Mr. Alpers that there is nothing that has helped along our meeting more than the work of the ladies of Richmond, and we will bear them in mind for the pleasure they have given to us and our lady friends, as well as for the benefit they have been to the Association. [Applause.]

The resolutions of Mr. Mayo were adopted unanimously.

MR. SEABURY: I think we should have a representative of the Virginia pharmacists to respond to these resolutions, and I call on Mr. Baker to say a few words.

MR. BAKER: I am rather taken by surprise, gentlemen. I had no idea I was going to be called upon, as I was not a candidate for President or Vice President, or anything of that kind. [Laughter] But this is not pertinent.

I think that no one can appreciate more highly the compliment you have paid the ladies of Richmond and the members of the committee generally than we ourselves. We do not assume that we have deserved all the kind things you have said about us, but at the same time it gives us enhanced pleasure to think you will go away from the capital of the Old Dominion with the good impressions which we are led to believe are in in your minds. I hope they will continue as long as the Association lasts, and as long as we last. [Applause.]

THE PRESIDENT: Fellow members, before we entertain a motion to adjourn I would like to say a word on behalf of the officers of the Association for this meeting. While we enter most heartily into the spirit of these thanks to the people of Richmond and Virginia for the fullness of their hospitality and for all that they have done for us to make this indeed a memorable meeting, it is a privilege to have also a word of thanks to the membership, which has been so helpful to us—and many words of thanks would not express our grateful appreciation of the kindness of the membership of this Association, their helpfulness in all the work which we have had to do. Speaking for myself I can say that it has been a pleasure to perform the work of any duty placed upon me, and I can say that no duty can be onerous to any officer of this Association with the spirit of helpfulness and co-operation and cordial good will, the support and encouragement, which you extend to us. I feel that this encouragement is not always fully deserved, but it comes from the heart, and is a part of that fraternity which makes the American Pharmaceutical Association one in action and one in feeling, and points to a period of greater prosperity for it. [Applause.]

MR. MAYO: I do not like to move all the votes of thanks I feel, but I think a vote of thanks is due to the retiring officers of the Association, and I therefore move the thanks of this Association to these officers, not only for their efficiency in the discharge of their duties, but for the kind and courteous manner in which they have conducted the business of the Association.

Mr. Lowe seconded the motion.

Vice-President Beal took the chair and put the motion, which was carried by a unanimous rising vote.

Upon motion of Mr. Whelpley, the Association then adjourned.

CHAS. CASPARI, JR.,
General Secretary.

TWELFTH SESSION—SATURDAY MORNING, MAY 19, 1900.

In the absence of the President and Vice-Presidents, the Association was called to order at 10 o'clock a. m. by T. A. Miller, late Local Secretary, in accordance with a resolution adopted at the eleventh session.

The General Secretary also being absent, the Chairman appointed R. H. M. Harrison to act as Secretary *pro tem.*

No new business being presented, and the social session having been concluded, it was, on motion of A. G. Briggs, seconded by Wm. H. Scott, agreed that the Association do now adjourn to meet again at St. Louis, Mo., in the month of September, 1901.

R. H. M. HARRISON, *Secretary pro tem.*

MINUTES

OF THE

SECTION ON COMMERCIAL INTERESTS.

FIRST SESSION—TUESDAY AFTERNOON, MAY 8, 1900.

The first session of the Section on Commercial Interests was called to order at 4 : 30 p. m. by Chairman Good.

THE CHAIRMAN: It is understood that delegates from other organizations who have been recognized by the Association are accorded the privileges of the floor here as elsewhere. This general recognition includes the deliberations of the Sections. If there are such delegations here from the National Wholesale Druggists' Association, or the National Association of Retail Druggists, or any others, they are to consider themselves welcome, and are invited to participate in the proceedings. If there is anything to be considered before the Chairman presents his address, I am at your service; otherwise I will ask Mr. Stedem to take the chair while that is read.

Mr. Stedem took the chair, and Mr. Good read the Chairman's address as follows:

Fellow Members: The American Pharmaceutical Association has its critics. This is to be expected, for it also has a history.

It has an enviable record for good work done, and on its rolls are found the names of many men who have labored effectively and unselfishly to advance the best interests of pharmacy. An association can be no better than its best members and no worse than its poorest ones.

These men, acting collectively and in an official capacity, are likely to be, and are expected to be, conservative rather than radical. They have not lacked courage in official action, yet there are critics who seem to consider them responsible for the "Slough of Despond" in which, in a commercial sense, many druggists find themselves wallowing to-day.

The commercial problems with which we are wrestling are not as old as our Association.

Organizations created for the specific purpose of solving them have sprung into existence, lived their day and subsided into "innocuous desuetude." Their work during the intervening periods has been assigned to this Association. Thus it happens that much of the time during the last ten years the business man of our fraternity had no organization to which he could appeal except the "Commercial Section of the American Pharmaceutical Association." That he has not fully availed himself of the opportunities offered him we regret, but we cannot assume the responsibility for the loss, whatever it may have been. The National Association of Retail Druggists is now working actively

and effectively for the betterment of the commercial side of pharmacy. If druggists generally will give it sympathy and co-operation, and, in the face of changed conditions of trade, not expect too much of it, it is an organization which will grow in years and breadth of influence.

As to our critics, who assert and complain that this Association is "run" by the Professors in Colleges of Pharmacy, we repeat that the co-operation of all has always been invited. It has been solicited. To stay at home and find fault with what others do is not creditable. To take hold and help to mould the policy of an organization is much more so. Unless there be a commercial side to pharmacy the professors will soon be without students to instruct.

The papers presented by them are, to the average druggist, sometimes abstruse and technical, but more frequently they are utilitarian and have a direct commercial value. Reading and discussing papers constitute an important feature of our meetings. If the professors fail us in this we are likely to find ourselves sometimes without "proceedings." The real, we may say, *money value*, of the "Report on the Progress of Pharmacy" should recommend this Association to the every day business man. Those who attend our annual gathering have, happily we think, been able always to take away with them a positive feeling of pleasure, as well as profit, from the conference and intercourse; yet we would like it understood that our work is unselfish and that these yearly trips to different parts of the country are not simply occasions of sight-seeing and enjoyment. Few of us have either time or money to spend in such a manner.

That the last few years have seen great changes in the drug businesss both as to profits and products dispensed, all will admit. That the original conditions will be restored, few observing or thoughtful men believe.

The changes seem more like retrogression than evolution. The evil of "cut-rates" is not the cause of change. It is the result of it. It is applying the methods of the department store often to recover lost trade.

Our business is partaking of the general disturbance which is affecting the retail dealer in all classes of merchandise. The general public insists on regarding us as merchants, mainly. We chafe under prevailing conditions. The "Chemist and Druggist" of England says:

"A pharmaceutical unrest prevails from St. Petersburg in the East, to St. Louis in the West." We would add that the geographical line does not stop east of the Pacific Coast. We are disappointed that a return of what are considered prosperous times has brought us no perceptible relief. While we must acknowledge that general conditions are difficult to handle, there are usually some special reasons why one man will succeed in business and another fail, and these it is profitable for us to investigate with such light as we have. What then are some of the causes of failure? Deficient education in business principles and methods includes a great many of them. As a merchant, the druggist is usually outclassed by those in other lines of trade. In preparing himself for his profession he has neglected the study of those things which count for much when one comes in contact with shrewd men of the world.

An expert chemist is possible only in the man who can give his undivided attention to his specialty, but there need be no incompatibility between education and a keen perception of what constitutes strong business sense. In all of the affairs of life one has opportunity to use all of his talents. All of his energies must be directed by intelligence, if he would succeed. With this thought in mind, some questions on subjects touching simultaneously the ethical, professional and commercial sides of our business have been framed. It is to be regretted that they have not had wider circulation. They affect us not for a day only, and so I repeat them for consideration at this meeting, or at a future one. They are as follows:

Methods whereby legitimate pharmacy may be made profitable.

Methods for interesting physicians in preparations of the Pharmacopœia and the National Formulary.

The practice by physicians of dispensing their own remedies.

Checking the growth of the Free Dispensary evil.

A proper amount of the commercial spirit in the practice of legitimate pharmacy.

Buying, selling and care of stock.

Methods of advertising.

The "Commercial Course" in a College of Pharmacy.

The commercial value of a pharmaceutical education.

The druggist in whom the commercial instinct predominates will, we may repeat, find ample opportunity for the exercise of his talent in the National Association of Retail Druggists.

It is possible for many of our own members to become actively interested in both Associations, but leaving the patent medicine and cut-rate problems to be solved by that Association, may not this Section of the American Pharmaceutical Association devote itself to the consideration of the questions suggested and others of a similar character? The changes which have taken place in the practice of medicine and pharmacy during the past few years have affected us adversely. The "dispensing doctor" has become numerous of late. Manufacturers of pharmaceutical specialties have made him possible. Struggling with adverse conditions himself, he is easily persuaded that that way lies relief. He invests in a limited stock of tablets. One fee, only, for consultation and medicine appeals to the patient. Perhaps what he happens to have on hand does not exactly fit the case, but he pretends it is not as wide of the mark as what he would have gotten from a written prescription. That plausible agent convinced him, after showing him that it was to his selfish interest to buy his tablets, that druggists generally were "substituters," and therefore wholly devoid of conscience. So far as druggists, by their practices, confirm this judgment of them, they ruin themselves and damage the business. Strained relations between physicians and themselves follow. "Is there balm in Gilead?" wailed the orator. A druggist in the audience answered: "I don't know, but I have witch-hazel that's just as good."

A prominent manufacturer, in his investigations to ascertain the amount of substitution among druggists in New York City, by presenting prescriptions for his pills at thirty-eight different stores, had them properly filled at thirty-six of the stores. The two substitutions were by men whose methods of conducting business are not such as would ordinarily inspire confidence. He concludes his article on the subject with the following: "We are satisfied that the honest men far out-number the dishonest ones in the ranks of the pharmacist, and we believe that a great injustice is being done them, as a whole, by the misguided attacks which are being made upon them. The "Free Dispensary" evil is one which affects physicians and druggists alike. It is a subject upon which much might be said, but I resist the temptation to enter upon it here. I mention it as a factor which decides the dispensing doctor upon his course.

Notwithstanding the changes which have come during the last two decades, it is not likely that the practice of pharmacy will be absorbed by that of medicine, or that the two will be divorced. Advance in medicine and surgery during the last fifty years has been gradual, but it has been great, when we take in the whole period by way of comparison. Anæsthesia, Listerism, the use of the Roentgen ray in surgery; the study of bacteriology and the use of the microscope in investigating the causes of disease, are the strikingly important aids which have come to the practice of medicine. The pharmacist and the manufacturing chemist have each contributed their share in bringing about these improvements.

The practice of pharmacy has to that extent been influenced thereby. We must join in the altruistic efforts to abolish or prevent disease, trusting that our unselfishness will ultimately be rewarded.

A national law, to provide against the adulteration and sophistication of food and drugs, is among the possibilities of the future.

Conscientious druggists will not object to its enactment, provided it be not such a law as may be used against them unfairly, although primarily intended as a protection to the public. A good law in the hands of the proper kind of an executive officer, would be desirable. It is possible that we may not get both. Secretary Wilson, of the Department of Agriculture, grows enthusiastic in demanding such legislation, when he declares we want "cleaner government and greater purity in the lives of public men."

A greater man than Wilson taught us that "it is not that which goeth into a man's mouth that defileth him."

If our Pharmacopœia is to be used authoritatively by those entrusted with the enforcement of the law, the exaction of absolute purity in the case of many chemicals would be unwise and impracticable. It should not be possible to use the work as a means of persecution or unjust prosecution.

The plethoric condition of Uncle Sam's treasury vaults is just now troubling a great many people. The brewers have asked that the extra tax of one dollar a barrel on beer shall be removed. All along the line people are asking that war taxes shall be removed. In a certain sense it is gratifying to know that we are spending less money than we are receiving, but we must not forget that we are still paying out a great deal of money because of the war and the incidents which have grown out of it. Let us go slowly then, in our attacks on the revenue law. We should not too soon forget President Harrison's remark: "A surplus is more easily handled than a deficit;" yet if the people are being oppressed or any industries overmuch taxed, the condition of the treasury justifies a modification of the law. Some of its absurdities and inconsistencies should be corrected. Trade-marked or patented articles, medicinal or otherwise (do not limit the tax to medicines), can well afford to pay the government for its protection. Proprietors of medicinal agents have, in most instances, assumed the burden. There should be no tax on medicines or drugs not thus protected. Luxuries, the tax upon which may be collected of the consumer, are always legitimate objects of attention for the revenue officer.

It is to be expected that there will continue to be work for a "Commercial Section" in this Association, otherwise we might, very properly, ask the "Association for the Advancement of Science" to absorb us. The kind of commercial spirit which we need to foster is not that which resorts to the piratical methods adopted by very many merchants to-day.

Oliver Wendell Holmes, a generation ago, wrote a very readable essay, in which his remarks were addressed to Mr. Blank on his "Habit of Business Lying."

Mr. Blank, were he living to-day, would be considered a very mild kind of an offender in comparison.

Some statisticians say that an average of ninety-nine merchants out of every hundred fall short of what the world calls success. This is probably too low an estimate. The reasons for flat failures in business are usually not difficult to find. One very common cause is poor judgment in the selection of a locality for establishing it. Unfair or excessive competition which may follow is not within any one's power to control.

Reckless purchase of stock often cripples a man financially. "Especial offers" are frequently more or less delusive. They are always to be carefully considered; usually to be rejected. Insufficient capital, when competition is sharp, is a fatal weakness. Goods should be purchased at the best advantage and the bills discounted. A man's credit should be good, and to keep it so, no severe strain upon it should be allowed. The time has passed when one can start a drug store on credit and out of the profits pay notes as they become due. To tell a druggist that he must be economical sounds almost like irony. Some of them are unconsciously extravagant. Diluting fluid extracts and calling them tinctures is a case in point.

Purchasing easily prepared pharmaceuticals generally is the next step in that direction. The druggist, then, must also be industrious as well as skillful. If, as we have been told, the best type of pharmacist is to be found in the United States, let us deserve and maintain the distinction. Some foreigners dispute the claim. What part will the apothecary have in the possible conquest of the world by the United States which is causing alarm in Europe? A French writer recently said: "In less than eighteen years American exportations have tripled. It is no more a Napoleon's conquest of arms; the Yankees are doing it by work. The United States can ruin Europe commercially as effectually as if with arms. By that country a revolution in the economic equilibrium of the world is being brought about." We could have no higher compliment than this. We are proud of our soldiers and sailors, but "peace hath her triumphs no less renowned than war." Our industrial supremacy is likely to continue, but, in one particular at least, Europeans, and especially Germans, surpass us most emphatically; this is in the specialty of industrial chemistry.

The enterprising and conscientious druggist will supply the demand for these products. This means a considerable outlay of money (sometimes we think it means extortion), yet out of the hundreds protected by trade-mark and thrown upon our market, the really meritorious ones can be counted upon one's fingers.

The decrease in the use of drugs, coupled with the demand for ready-made products, explains, in part, why we are not affected favorably by the conditions of prosperity which surround us.

In the years when the druggists flourished the people consumed more medicine than at present. The demand is on the decrease. An alleged epitaph on a stone in an English churchyard is as follows:

"I was well; wanted to be better; took medicine; and here I am."

This is the abuse of drugs; but it is distrust in their efficacy, carried to extreme, which has made a certain pseudo-science possible, the inventor of which has been aptly styled the "Lydia Pinkham of the Soul." The question asked by our beloved "Autocrat" fifty years ago, "What will be the next humbug after homeopathy?" has been answered.

People are easily deceived; the business methods of to-day could not be possible otherwise.

There is a delusive fascination in the thought that a sacrifice is being made for one's benefit, or that one is getting something for nothing. If it is your ambition to do so, "you can fool some of the people all of the time." If we accept the balance of Lincoln's famous saying, there is hope for the future.

The address was received with applause.

Upon explanation by Mr. Good that the address contained no recommendations requiring its submission to a committee for consideration, Mr. Mayo moved to accept and refer for publication, and it was so ordered.

Mr. Good resumed the chair.

THE CHAIRMAN: I want to announce that Mr. Ryan has agreed to give us a talk either this afternoon or to-morrow morning on the subject of a commercial course in a college of pharmacy. He does this at my request. He is familiar with the subject, and will talk interestingly upon it, I am sure, It has been suggested that inasmuch as we have a delegation here from the N. A. R. D., this will be an appropriate time to listen to them. We shall be glad to give Mr. Holliday the floor now.

Mr. Holliday was applauded as he arose to speak:

Mr. Chairman, Ladies and Gentlemen: It seems to me unnecessary, as to some of

you, for me to make the report or statement I have to make concerning the work of the N. A. R. D. through its Executive Committee, for the reason that the trade journals have kept you pretty well informed about everything we have been able to accomplish; but I want to say that the general plan on which we have been working for some time past, with the view of restricting the sale of proprietary medicines in certain directions, is very nearly completed. I think all of you who are in the retail drug trade—and even those who are not—will certainly be interested in what the Executive Committee are trying to accomplish; and in order to give it in as complete a shape as possible, I want to refer to a letter that I have just received this morning from Mr. Frank A. Faxon, Chairman of the Committee on Proprietary Goods of the N. W. D. A. When this plan was formulated, it was an arrangement between the retailers represented by the N. A. R. D. and certain individual proprietors. We came to an understanding at a meeting held in Chicago on the 11th of last month, when the Executive Committee of the Retailers' Association and Committees of the Wholesalers' and Proprietors' Association met for the purpose of conference and consultation as to whom these proprietors should select as their wholesale distributors. We supposed the work was done, but at that meeting the proprietors said: "We are agreeing to do certain things for the retailer; let us see whether the wholesaler wants this plan or not." So it was proposed that Mr. Faxon should communicate with the trade and see how they felt. I will read his letter:

NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION,

OFFICE OF COMMITTEE ON PROPRIETARY GOODS.

KANSAS CITY, MO., MAY 5, 1900.

CONFIDENTIAL.

To Wholesale Druggists:

At the suggestion of the retail trade as represented by the N. A. R. D., and in pursuance of views expressed by a large percentage of the jobbing trade, each of the proprietors named within has recently announced his individual determination to absolutely confine his sales at best price to a uniform list of jobbers who will be selected to act as his wholesale agents upon the following conditions:

1. "Jobbers, through their salesmen, to refrain from running down proprietary goods, and give instructions to sell what is called for, without preference to any particular article which may happen to pay a higher profit."

2. "Jobbers to refrain from asking any further discounts than those at present allowed."

3. "Each jobber for himself to discontinue his non-secret department."

4. "Jobbers to refrain from selling proprietary preparations at any price, either directly or indirectly, to aggressive cutters and brokers, or to any party supplying aggressive cutters or brokers."

The "aggressive cutter" is defined as the dealer who is designated as such by not less than seventy-five per cent. (75%) of the local retail druggists, and the definition of the term "non-secret" is a preparation made for or by a dealer to be offered when a proprietary article of like nature is called for.

This plan was carefully considered and endorsed by the Proprietary Committee of the N. W. D. A. at a meeting held in Chicago on the 11th ulto.

Several leading proprietors recently advised me as follows: "Now, to secure success and early action, we *insist* that jobbing houses individually agree to this plan, and *and orders should be declined from such houses as do not agree.*"

From the foregoing, you will see that it is absolutely essential for every jobber in the country to declare, without delay, his purpose to accept the conditions of the proprietors, and give his most cordial and earnest support to the new plan, which must have the endorsement of the jobbers individually before it will be put into effect.

If you wish to act as agent for the different proprietors under the conditions proposed, please sign and return to me the attached document.

Yours very truly, FRANK A. FAXON, *Chairman.*

MR. HOLLIDAY continued: Now I have here a list of about sixty proprietary houses who have agreed to this plan. I will say there are perhaps 7 or 8 more who have entered into this plan since the list was made up, and there are also some 13 or 14 more who have given in their conditional consent, making some slight qualification—some of them want to know, for instance, what concerns have agreed to this plan.

As far as the committee are concerned, we feel that this plan may be carried out with

the 60 names—or a great many less, even. But we expect to have the adhesion of nearly all the proprietors, after the plan has been more definitely explained to some of them.

Now, what the proprietors propose to do is this: Providing the conditions named in Mr. Faxon's circular of May 5th are accepted, the several proprietors will incorporate in their plan of sale the following terms, which must be accepted by their wholesale agents:

To houses that we appoint as wholesale distributing agents ordering at one time, and for one delivery, in quantities of not less than ..... gross, or $ .... who do not quote or sell our preparations, either directly or indirectly, or divide the above quantity with another party or parties, or permit our goods to be disposed of in any way by their salesmen or others, at less prices than those above stated, a rebate of ..... per cent. will be allowed upon payment of the invoice within .....days. If paid within ....days, we will allow an additional discount of ..... per cent. for cash.

On orders for not less than the above quantity, we will pay freight to destination by lines of our own selection.

It will not, however, be considered a violation of the above terms when wholesale agents, on their bills paid within ten (10) days, allow a discount not exceeding the customary cash discount on such goods in their section of country.

Believing that the sale of our goods to aggressive cutters and brokers is detrimental, not only to our business, but to that of the retail trade as well, we will decline to sell our preparations to any party supplying such cutters or brokers, either directly or indirectly, with our goods at any price.

Should complaints reach us that parties violate these terms, OR WE HAVE REASON TO BELIEVE THAT THEY HAVE DONE SO, we shall exercise our right, whenever we are satisfied that these terms have been violated, to decline the orders of parties who have failed to maintain them.

The above conditions are imperative, and the violation of them will be regarded as an abandonment of the rebate plan by any parties who have been acting as our wholesale distributing agents.

The retailer on his part, through the Executive Committee of the Retailers' Association, the National Association, has agreed—in fact, the resolution was passed at the Cincinnati meeting of the Association last October—that he will sell standard proprietary articles when called for, without any attempt at substitution; and as I have been going about the country meeting with groups of retailers of varying numbers, each one of them has accepted that as something they will carry out definitely.

The individual proprietor will refuse to sell the jobber who sells the aggressive cutter or broker who has been acting as a go-between in these dealings. Then the jobber refuses to sell the aggressive cutter when he is notified by 75 per cent. of the retail trade of his locality. The retailer on his part agrees to sell standard articles, or anything else, as called for.

I don't know that this is the best plan that might have been formulated, but it is the plan which a large majority of those interested in the drug trade, and who are trying to improve prices, have agreed upon as the best to be tried. We are committed to it thus far, and each of the retail druggists will have to decide for himself in each locality whether he is willing to carry it out by furnishing the names of those who are aggressive cutters in his locality.

The work of organization by wards in the city of Chicago is progressing finely, and has already been of great advantage; several of the ward organizations have helped their prices materially, not only on proprietary goods, but on others that have been cut ruinously.

With the stimulus that this plan ought to give to this movement, it seems to me the retail druggists should be organized within the next 90 days to such an extent as to wield a power that will enable us to take care of ourselves without a great deal of assistance from any one.

I believe that is all I have to say concerning this plan. If I have omitted anything you would like to know about, I shall be glad to answer any questions.

After a somewhat spirited and protracted discussion as to the details of

the proposed plan and the feasibility of its execution, which was participated in by Messrs. Alpers, Lowe, Holliday, White, Thompson, Seabury, Hynson and Henry, it was, upon motion of Mr. Hynson, agreed to proceed with the regular order of business.

Mr. Stedem offered the following resolution, which was laid over for future action :

Resolved, That this Association cordially endorse the work of the National Association of Retail Druggists and the plan proposed by their Executive Committee to lessen the evil of price cutting on proprietary medicines.

MR. JACOBS: I move, as an amendment, that we abolish the Commercial Section and join the National Association of Retail Druggists.'

MR. THOMPSON: Did we not endorse the National Association of Retail Druggists last year at Put-in-Bay ?

The chair called for the regular order, and Mr. Stedem read the following paper on " Methods of Advertising. "

METHODS OF ADVERTISING.

BY F. W. E. STEDEM.

In addressing you on this subject the writer will ask your kind indulgence for a few minutes for the purpose of reviewing the subject in a general way. To advertise is a necessity. Business is all done in this way through that means, and the man who neglects to advertise will surely fall behind in the race for recognition. I do not mean by this that a man may secure trade by means of advertising only, but granted that one has stock and does follow modern methods, that one will surely outstrip another, having an equally good stock, but failing to avail himself of his opportunities to advertise.

Druggists have two sides to their business, and can advertise either or both sides to advantage. That from which the influence of physician is to be gotten is the department of prescriptions or the business of furnishing medicines or supplies to physicians direct. The other relates to the means and methods of attracting the attention of the general public. I have found through experience that physicians are influenced by about the same conditions and circumstances that affect the run of the people in general. Because of this fact, I have always made it my business to call their attention persistently to any new condition or circumstance of trade at the earliest moment possible. It has been my plan for some years to address all the physicians of my acquaintance or all those within a reasonable distance of the store in a circular letter about twice a year. In this letter we call their attention to some special feature of the establishment and end up with a general description of the whole institution. At frequent intervals I send out printed postal cards or a small printed circular enclosed in an envelope and sent through the mail. This is used for some

one substance only, that is, only one substance or subject is written about at a time, and these should be sent out weekly, or at least not less than one a month. In the general circular I am always careful to call special attention to the laboratory facilities and *invite inspection*. I have also found it very profitable to supply physicians with the remedies and surgical dressings they use in their offices. Experience has taught me that we can sell to the doctors just as readily as the larger concern, and the only requisite is to go after their business. If one succeed in obtaining the trade of the doctor for materials of his own consumption, he will surely stand a much better chance of securing his influence among his patients, and most likely get the trade of all or the greater part of them. Once having gotten the doctor in the habit of trading with you, it is quite easy to sell him substances and remedies of your own manufacture.

The other side of our business is the one in which we come in direct contact with the people. Next to a well-kept store (and all that that means) the best method of advertising among the people is to send them samples of medicinal or other materials. For some years past it has been my custom monthly to select some article of popular demand and prepare several thousand small packages in suitable containers for distribution. These we put in a neat cheap envelope, each containing (besides the sample of medicine) an exhaustive descriptive circular as to the uses, dose and cost of the remedy. These circulars are always made to answer the purpose of a general advertisement of our store, and particularly the prescription department. The remedy under consideration is recommended to be used instead of some patent medicine, and a statement of comparative cost made. We take anything from Epsom salt, compound licorice powder and cathartic pills to Castile soap, borax, powdered alum and boneset. One of the most profitable advertisements I ever made was with ground black pepper.

If not out of place I would like to direct the attention of all to the advertisement pages of our pharmaceutical journals. I venture to suggest that many of our brothers read the wrong side of the journals most carefully. That is, they waste many hours reading long articles on old subjects, by writers of so little knowledge that they do not even know that the subject is old or has long ago been exhausted, and fail entirely to study the advertising pages. Most of us can learn very much out of the advertising of the journals, and still more through a close study of the advertisement pages of the daily press. It will pay any one many times over to make careful examination of any idea in advertising that can be adapted to his business or that would appeal to the people of his neighborhood.

Mr. Lowe moved to receive the paper for discussion and refer to the Publication Committee. Carried.

MR. ALPERS: I believe this paper is one of the best that have been offered the Section. The idea of selecting pure drugs and sending them to your customers is a very good

one, and I shall certainly act on it. This has never struck me before. I think it must be a good way to advertise your store by sending a good sample of something that the lady of the house or the cook can use—like a sample of pepper; something useful, and that can be used every day. I will add, though, that this advertising can be made more effective by mailing the samples, though it is more expensive, of course. To illustrate, I mailed 8,000 circulars about six months ago, when I opened my store, and after that I distributed a lot of 4,000 circulars. The returns from the former were largely in excess of the second circular. I afterwards mailed a third circular, at a cost of $160, and the returns have been most remarkable again, showing that the expense of mailing samples will be largely repaid in a short while.

MR. STEDEM: In speaking of this plan to some of my friends in Philadelphia, I have always been asked the cost of making the distribution, and it usually appalls them. But that is a matter of secondary consideration. Speaking for myself and my brother—we always act together—I can say that the result amply justifies the outlay. We usually get out 8,000 samples jointly. I take 5,000, and he takes 3,000. We find that cost is nothing when the returns are considered. We nearly always sell enough of the particular substance we are advertising to pay the cost of the thing, and then we make new customers and sell other goods. We have made a number of computations at different times in the last few years that we have been doing this, and we believe we get one new customer for every 1000 samples sent out. The great advantage is this: You induce people to listen to what you have to say. At the risk of appearing a little egotistical, I may say that, with such methods and careful attention to business generally, despite some new competition in the neighborhood, our prescriptions have gone on increasing steadily.

MR. WHELPLEY: I would like to commend the very practical nature of this paper. We have here a practical retail druggist who, instead of spending his time bemoaning the loss of druggists' sundries, which drift into other lines of business, turns his attention to finding out in what way he can increase the legitimate features of the drug trade, and picks out, not those articles that he must compete with in the cut-rate stores, but legitimate articles—pure drugs, useful to the average member of the community; and in that list he includes practical things for household use, such as spices, etc. I don't think it is necessary to take up the time in dilating on this question, but I am fully convinced that each one here who is engaged in the retail drug business can add many new and permanent and valuable customers to his list of patrons if, after going home, he will read over this paper, and act upon the suggestions of Mr. Stedem.

On motion of Mr. Alpers, the Section then adjourned, to meet to-morrow morning at 10 o'clock.

SECOND SESSION—WEDNESDAY MORNING, MAY 19, 1900.

The Section was called to order at 10:45 a. m. by Chairman Good.

On motion of Mr. Mayo, the reading of the minutes of the session of yesterday was dispensed with.

THE CHAIRMAN: If there is no special business to come before the Section at this time, we will proceed to the reading of papers. I will ask Mr. Stedem to take the Secretary's place while he reads a paper that has been handed him.

Mr. Rapelye then read the following paper by Louis Emanuel, of Pittsburg:

A SCHEME TO POPULARIZE THE UNITED STATES PHARMACOPŒIA AS THE ONLY MEANS TO COMBAT QUACKERY IN MEDICINE.

BY LOUIS EMANUEL, PITTSBURG, PA.

Dr. A. B. Lyons, Chairman of the Section on Education and Legislation, in his address last year, fully laid before the Association the barefaced methods of quack medicine advertisers in the various medical journals. The Association passed a resolution asking for the publication of said address in the American Medical Association Journal.

Dr. Lyons asks for a remedy to combat this growing evil, and expresses a doubt that a remedy is to be found.

In suggesting a plan, which is based on the identical methods used by the quack medicine man, let me tell of my experience with the method in order to show its practicability.

A few years ago I was requested by a medical friend to prepare a special capsule containing sandal oil. In looking over the price-lists of volatile oils we find a great variation of price. Thus we see the German, English, French, East Indian, West Indian, etc., but none are designated United States Pharmacopœia. The doctor could not see clearly why there should be such a variation in price. However, the higher-priced oil was selected, on the assumption that it was the better; a little of all kinds on the list was purchased for the purpose of comparison. All were submitted to the pharmacopœial test, but none complied with it. This was a puzzler. High-priced oils were purchased in various markets from time to time, which also failed to comply with pharmacopœial tests. We had about concluded that the Pharmacopœia was *wrong* and this jobber was *right*. Finally a perfumer offered to supply absolutely pure volatile oils in small quantities, but at a good round price. A pound was purchased, and great was the satisfaction that it complied with the pharmacopœial tests. Heretofore a doubt was felt that perhaps the Pharmacopœia was too exacting; in fact, a large Eastern house greatly ridiculed the volatile oil section of the Pharmacopœia. However, an oil was at last found that would stand the requirements. The new oil was put into capsules without mentioning the fact that an official sandal oil had at last been found, but in due course of time the prescriber made inquiry whether or not a change had been made. This came as a surprise, as I feared that, perhaps, after all, the United States Pharmacopœia was *wrong*, and the *average* jobber *right*. I was obliged to acknowledge the fact that a change was made, but I justified myself in the fact that I had paid two dollars a pound more for the oil which was being used. "Well," he said, "I thought there was a change in the oil, or else my patients had less severe attacks of disease than formerly, for they get well quicker."

The price paid for this oil was nine dollars a pound, but after that I had no trouble in getting just as good oil at seven dollars, when the jobber found I knew what I was talking about.

After this my medical friend talked of my sandal oil capsules among his medical friends, which led to a large demand for the capsules, much to the detriment of an imported proprietary article.

Where I formerly bought a quarter of a pound oil of sandal at a time, I now buy it in one hundred pound lots, and I am obliged to give the United States Pharmacopœia the credit of the commercial advantage beside the ethical nature in conducting a retail pharmacy; for, in due course of time a representative of a domestic house made his rounds in my locality, and almost succeeded in introducing his wares, by using unfair means; this led to an examination of his material, which was found sadly wanting. The advent of these inferior goods led to the following advertisement:

APPLY THE TEST.

1st. It is a matter of common report that many manufacturers' agents misrepresent and belittle the legally qualified pharmacist when a proprietary remedy is brought to the notice of the physician.

2d. It is surprising to note how many members of the medical profession are misled by such misrepresentations.

3d. These detractors ignore the authority of the Pharmacopœia, rise superior to it, as it were. (P. S. — It often cheapens the process of manufacture to ignore the United States Pharmacopœia, and of course is more profitable to the agents and their employers.)

4th. An example: When selecting a form of oil of sandalwood for administration, test, or have your pharmacist test for you, some of the commercial preparations of this remedy, whether in capsule or other form, and note the result. If it fails to agree with the United States Pharmacopœia test, namely, to produce a clear solution, if to 1 Cc. of the oil, at 20 degrees C., there be added 10 Cc. of a mixture of 3 volumes of alcohol, and 1 volume of water, it contains cedarwood oil, castor oil, paraffin oil, or some other fatty oil, perhaps deleterious to the patient, and who can tell but that the frequent failure in the attempted cure of patients may not be referable to adulteration.

Moral: Prescribe no drugs that have not been subjected to proper tests by proper persons.

LEWIS EMANUEL, PH. G.

Second Avenue and Grant Street, Pittsburg, Pa.

The advertisement was the means which made it possible for every pharmacist in this locality to purchase Oil of Sandal U. S. P., which was impossible a few months before.

The proposition is a systematic and persistent advertising in the American Medical Association Journal of ethical preparations under the guidance of the Commercial Section of the American Pharmaceutical Association, which may also co-operate with the various State and Local Associations by supplying examples of advertising matter for ethical medicine, something on the plan of the examples of advertising matter submitted by the varions pharmacy journals for specialties.

I offer the following example, which has done much to replace a nostrum which was much lauded as a specific for melancholia.

Similar advertisements would go far to mitigate the nostrum evil and lead to popularizing the Pharmacopœia, among both the pharmacal and

medical profession. It will supply a *large* field of labor and a legitimate one for the Commercial Section of the American Pharmaceutical Association.

SODIUM PHOSPHATE, U. S. P.

In obesity, hepatic diabetes, incipient hepatic sclerosis, chronic infantile diarrhœa, cerebral debility, and for the system when producing a crop of boils, is probably the best remedy.—*Potter.*

LIQUOR SODII PHOSPHATIS COMPOSITUS.

(Non-Proprietary),

is the most convenient form to administer the salt.

EACH FLUID DRACHM CONTAINS:

Sodium phosphate, U. S. P.	1 drachm.
Citric acid, U. S. P.	10 grains.
Sodium nitrate, U. S. P.	5 grains.

Mr. Ryan moved to accept and refer for publication. Carried.

The Chairman then asked Mr. Hynson to take the chair while he read a paper by Mr. Jacobs, of Atlanta, upon "The Commercial Value of a Pharmaceutical Education," explaining that the writer was absent, and that the Secretary had not had time to read the paper over, though he himself had done so.

THE COMMERCIAL VALUE OF A PHARMACEUTICAL EDUCATION.

BY JOSEPH JACOBS.

In every age of the world there have been those who decried the value of educational devices and influences. Even in the present, men are found who cannot perceive, or profess they cannot perceive, any good in any of our institutions that promote learning. But every thoughtful mind must confess that among the greatest benefactors of mankind must be rated such men as Alfred the Great, Girard, Peabody, Jefferson and those still living who have gladly laid broad foundations for the dissemination of knowledge and the encouragement of learning.

To the efforts of such men as these and of the master teachers of antiquity, we may, indeed trace the influences that have made of education a matter, in the language of Edward Everett, "as common as the common sunshine and the common rain."

As pharmacists, therefore, our Association has always properly given a large part of its energy and devoted much of its interest to the cause of the special training necessary to the followers of our pursuit. So, in the course of the development of American pharmacy we can all point with pride to the splendid special colleges that are devoted to preparing the young pharmacists of the future for efficient and successful lives.

If I were addressing the young undergraduates of our schools, I should feel like warning them against the mistake of failing to be devotedly attentive

to every branch of their course, because as they go along they might not appreciate the commercial value of or the practical use of the lessons as they follow one another. All of us who have passed along the pathways of our profession know the losses and crosses that have come from want of accurate ready knowledge of pharmaceutical subjects. How often may we have been compelled to miss the golden opportunities for forwarding our commercial interest, while spending time investigating some topic with which our college days should have rendered us familiar. If the young undergraduate could only be made to reflect, he could easily see that all knowledge that is founded on truth, and that is acquired in the schools, is at the time, very often meaningless, so far as its use is concerned to him. I doubt if there is a man present who, after depositing his "satchel" at school after his "snail's" progress there and with shining morning face performed the operations of Arabic notation or mumbled out the multiplication table, but who, at the time, thought all of it was so hard, and rebelled at studying such trash because "he couldn't see any use in it." The same was true in all our progress in arithmetic. What an impractical jumble our vulgar fractions appeared to us, and even the tables of the apothecaries in compound numbers only seemed a faint reminder of the nauseous castor oil our mothers used to make us gulp, and the turpentine that was the soothing rubefacient for our stone bruises. Our grammars were nothing then to us but the senseless jargon of big words and difficult rules; and how valueless appeared the instructions of our patient teacher as to how to hold pen and paper while struggling with that copy; "Evil communications corrupt good manners," or "Kind words can never die."

The value, commercially, of a thorough pharmaceutical education is composed not only of the daily uses to which it is adapted, but in the training given to the mind while acquiring that education. Making the nice distinctions in formulæ of chemistry, calculating quantitative elements of compounds, memorizing tables and names and mastering the intricacies of processes, ascertaining and remembering incompatibles, and dealing with all the minutiæ of chemical changes, trains the mind for accurate, patient investigation of details, while the study of the widely different sources of the occurrence and supply of medical agents enlarges the scope of the mental horizon, and thus when the graduate must solve the problems of the business of pharmacy he can patiently study details in lights from widely extended sources.

Business, at last, is but the practical supplying of the wants of mankind and carrying on the necessary affairs of life. That pharmacist who best and most thoroughly knows the scientific side of his profession, and whose education has trained his intellect to quickly master in detail the facts of each business condition that confronts him, will be most likely to make a commercial success of his avocation.

In our colleges much attention is being given to the experience or practical side of pharmaceutical education; but our noble professors, who have dedicated their talents and time to the training of youths, should be cheered by the thought that the theoretic side of their teaching is also implanting powers that will aid their charges more successfully to cope with the difficulties that lie across the pathway to commercial precedence.

On motion of Mr. Sayre, it was ordered that the paper be accepted and take the usual course.

Mr. Good resumed the chair.

THE CHAIRMAN: The next thing on the programme this morning is a talk by Mr. Ryan on "A Commercial Course in a College of Pharmacy."

MR. MAYO: I would like to bring up a question that should be of interest here. Nearly every organization in the country embracing pharmacy has passed some resolution in regard to a repeal of the stamp-tax, but so far as I am aware the American Pharmaceutical Association has not done so. I think it is proper that it should do so, and I therefore offer the following:

WHEREAS, There is a growing surplus in the Treasury of the United States; and,

WHEREAS, That portion of the stamp tax law known as Schedule B operates most unfairly, imposing, as it does, an income tax equal in the case of the retail druggist to some 30 per cent. of the income derived by him from the sale of proprietary preparations; therefore, be it

Resolved, By the Commercial Section of the American Pharmaceutical Association, that the Congress of the United States be, and is hereby petitioned, to repeal Schedule B of the Revenue Bill.

THE CHAIRMAN: Any action we might take would have to go before the Association in general session for action or ratification.

MR. MAYO: I think the resolution covers the ground properly, and I move its adoption. I think we are competent to act on that as a Section.

MR. NATTANS: I second the motion of Mr. Mayo. In reference to this question, I think this is, beyond all doubt, the proper Section to pass upon the resolution. It is to the interest of all of us to see the stamp-tax abolished. It appears that the National Treasury is well-fixed, and that the time is appropriate for us to make known, as other bodies have, that we desire the tax abolished, and the sooner the better. I don't think it will be done at this session of Congress, but I do think that at this meeting of the American Pharmaceutical Association action upon the question is proper, for use at a subsequent session of Congress; and I also think that action by us would have a considerable influence upon the action of the Congressional Committee, as we are presumed to be the representatives of the druggists of the United States. The question of whether this matter should come up here, there or elsewhere, is really of very little importance. The main question is, whether this is good for us—whether it will have the effect we desire, or will be in that direction; and if so, it appears to me as though, being of a commercial character, the Section on Commercial Interests should take action.

MR. MAYO: Aside from any force our action might possibly have with Congress, it seems to me highly desirable that the American Pharmaceutical Association should place itself upon record—and particularly this Section—as the watchful guardian of the interests of the practical pharmacist, by taking active cognizance of everything that affects

the commercial welfare of the retail druggists of the United States. We have heard the most unfavorable reports from the Secretary of the Council, and from the Chairman of the Committee on Membership, showing that we have a constantly decreasing membership—that while we retain a high average among the teachers and professional men in pharmacy, our ranks are being depleted by the falling away of members engaged actively in the retail business; and we should take every possible means of showing the men behind the counter that we recognize their necessities, and will protect them in every possible way. I think the moral effect of the passage of this resolution will be good upon the pharmaceutical community at large. It is rather a fine distinction as to where it should come up; but while it affects the subject of legislation to a certain extent, the result will particularly affect the commercial side of pharmacy, and I think it would be better to come from this Section, for, if it comes from the Section on Legislation, it will not have the force and the definite character of commercial interest as if it came from this Section.

THE CHAIRMAN: The vote will be upon the motion by Mr. Mayo, and the Chair decides that any official action on that matter should be brought before the general Association: the most we can do is to recommend that the Association in general session shall take such action. With that understanding, the vote will be taken.

The resolution of Mr. Mayo was adopted accordingly.

Mr. Hynson moved the regular order, and that Mr. Ryan be now invited to make his address upon the subject of "A Commercial Course in a College of Pharmacy," and it was so ordered.

Mr. Ryan spoke as follows:

Mr. Chairman and Gentlemen: I am very much afraid our Chairman made a statement in his announcement of this matter yesterday which will lead you to expect something unusual from me at this time. I have not prepared any copy, but inasmuch as I have had a personal experience during the past winter on the subject of commercial training in a College of Pharmacy, the Chairman doubtless thought I could present something of interest to you, and has been kind enough to ask me to address you on that subject. The question of whether or not it should have been presented here, or in the Section on Education and Legislation, was not clear in my mind, but as the subject necessarily touches largely the commercial interests of the profession I think it is proper here.

We hear a great deal—and have for many years—about the commercial training of the retail druggist, and it is very common for many to say that, of all business men they come in contact with, the retail druggist is the least well-informed of the various classes in business. Whether this is the case or not I am not prepared to say, having had very little to do with any other class, and many of you are better qualified, perhaps, than I am to pass judgment on this claim. However, there is no question in the minds of any of us, I think, that the average young man in the retail drug store is not possessed of the qualifications which give to him the ability to carry on the retail drug business in a good, commercial manner.

Whether or not it is the province of the College of Pharmacy to teach this subject to its students and supply their deficiencies in this regard is a question for discussion, and it has been discussed in many of the pharmaceutical journals. To my mind the situation is about this: We must accept things as we find them at the present time. If there is a deficiency in the business qualifications of the young men that come to us, I consider it wholly within the province of the College to supply this deficiency until such time as the deficiency disappears by the student preparing himself before he enters a school of

pharmacy. From my experience during the past winter, I am more than ever convinced of the necessity for a business training for our young men—and my experience has been with high school graduates. Even with those who have had considerable experience in good retail drug stores, the deficiency in the fundamental principles of business methods is certainly very apparent. I mean by that that the young man in the average retail drug store never gets an opportunity to carry out for himself the business methods and dealings of the establishment, which are almost always—I mean in the smaller stores—attended to by the proprietor: the buying and selling of goods, attending to the banking of the establishment, calculating discounts, and subjects of that kind. The management of the business along these lines is almost wholly done by the proprietor of the establishment in the smaller stores, so that the clerk has very little opportunity to become acquainted with the methods of business. Now, when I tell you that of the students in my class of instruction during the past winter only a little over five per cent. had any training whatever in business principles or business forms, you can see that there is a necessity for this, and yet the most of these young men were high school graduates or of good general education.

It has been argued by the pharmaceutical journals that the proper place for instruction of this kind is in the business college. Before taking up the course for this work, I took the pains to investigate as to what is done in the business or commercial colleges of the country. There is no question that if a man wants to be a banker or broker, or the manager of a large financial institution, or wants to deal in real estate or do a shipping business—anything of that kind—the proper place for the principles of education to be gotten is in the commercial schools. But when you come to a specialized occupation, like that of the retail pharmacist, you will find that you cannot get in the commercial college the exact thing you want, and the special points which are necessary more in the retail drug business than almost any commercial occupation that I know of are not given in a commercial college. They apply their teaching and work entirely to a general business education, and do not specialize in those particular things that the retail druggist, because of the professional side of his occupation--as well as the commercial side--ought to learn in his commercial training.

I have prepared nothing upon this subject to present to you, but I happen to have with me a synopsis of the course that was given during the past winter in the college, and I will run over it to show you exactly what I consider a feasible plan for such instruction, and in practice has been proven to be very satisfactory. The interest that was taken by the students was something marvelous, and I guarantee that any one who will take up such a course with his students will find them greatly interested in the work. Of course, there is a question whether it is proper to teach this in a college of pharmacy; but if the students accepted are deficient in this particular branch, and we can by any means give them such instruction as will place them on a solid basis as to business principles and forms, I think it is our duty to do so. When I say to you—and I know that every dean, at least, and I think many of the professors of our colleges of pharmacy, present will bear me out—that some of these young men do not even know how to draw a check, and that the endorsement of a check is something they will almost always get wrong, I am sure you will be surprised. If a check is drawn to James Smith, they will endorse it *J.* Smith, and it will come back from the bank. We all know there is a deficiency in this regard.

With the view of illustrating what was done, and what I think can be done in every institution, I will run over this synopsis of the subject—and I may say that when one starts out to teach this subject in a college of pharmacy, or anywhere else, he will find himself handicapped in the selection of material, and not in the dearth of it; there is abundance of material for his consideration, it is only a question of selection.

A course of commercial training should begin with a discussion of the laws of busi-

ness. As all business, of course, is founded upon the laws of our country, our business transactions must conform to them, and a good understanding of both common and statutory law as it applies to business must be had, and a general lecture upon this subject was given.

Then what is known as the "law merchant" was fully explained. Under this head are the laws of business. This must be defined and laid out before your students. Then, of course, the exceptions to the laws, such as apply to minors, imbeciles, etc., were explained.

The next subject considered was the money of the country, and it should be explained to the student exactly—the different kinds of money we have, the purposes of each, and the laws in regard to the same.

Then I found it feasible to take up the subject of individual bank-account. We can't do much business without a bank, and the students had explained to them the method of depositing and the keeping of a bank-book, and the other simple forms that go to make up the work of banking as done in the ordinary store.

In that connection they had explained to them the drawing and endorsing of checks, and the methods and precautions used to prevent the raising of checks, etc.; the stoppage of payment on checks, and the certifying of checks; the guaranteeing of a signature on a check and its purpose, and practical exercise in all of these All these forms were actually carried out by the student himself, and they did the work among themselves exactly as if they were in business.

Then the subject of drafts (or bills of exchange) was taken up, and the difference between them and checks explained. The special steps under the head of drafts would be definition, form, parties to, kinds of, uses, acceptance, etc., protest, draft with bill of lading, etc.

Promissory Notes was the next subject considered, and under that head would be definition, form, parties to, place of payment, maturity, protest, and so on. It is, of course, very important that they should understand the law in regard to promissory notes — the law of protests, for instance—in order to be able to protect themselves.

Due bills—that is a small subject, and we need not dwell upon it.

Then the subject of bank drafts engaged us—New York and Boston drafts—which are bills of exchange. They had explained to them the meaning of a cashier's check, certificate of deposit, foreign exchange, letters of credit, postal and express money orders, money by telegraph, express and registered letter. This teaches the young man how he may transmit money in the conduct of his business by one means or another.

The subject of banking was gone into, in so far as it applied to the different kinds of banks we have, that is, National, State, savings and private banks. They were also told, under this head, about the functions of safe deposit, loan and trust companies, and the regulations controlling them; each one was explained, so that they would understand the advantage of doing business with the different kinds of institutions which are in existence. Believing that the young man should also be posted on the subject of building and loan associations, that feature of the business world was taken up and thoroughly explained, and, I may say, highly commended.

The general subject of insurance, fire and life, was explained to the students and the necessity of the same thoroughly advocated, and the impression was attempted to be made that it was just as much a business proposition for them to take care of their life insurance as the insurance on their personal property and real estate.

The subject of transportation: That is a very large subject if inquired into on a scale of large commercial enterprise, but sufficient of the subject should be taught the young man to acquaint him with the rules of transportation, and to show him the responsibility that he incurs, as well as the responsibility that the shipper has in the shipment of goods.

The subject of mercantile agencies, such as Dun's and Bradstreet's, was explained. A

misconception that a great many men have is, that when an agent of a mercantile concern comes to them and asks for a statement of their affairs he is taking an unwarranted liberty. I have known not less than half a dozen men who, though otherwise good business men, have said to these gentlemen, "It is none of your business. I can pay my bills; I don't ask any credit, and that is all there is of it." But that is not all of it. The young man should know that his standing in the community is largely rated by these reports.

The law of contract was taught. A man must know what he is doing when he makes a contract.

Then there is the subject of deeds. The application of the law to that was explained.

On the other hand, the subject of mortgages had also to be explained.

The law of leases is a very important subject. The common understanding of the significance of a lease is quite different from the law in many of the States. In most of the States the law of leases would compel you to rebuild the house you lease if it burns down during the period of the lease. That is, if you lease a house for two years, and during that time it burns down, the owner can, by law, compel you to rebuild it. These things are not usually enforced, but that is the law. It seems to be very unjust, but it is not when you come to consider it thoroughly.

Now, as to the practical part of business:

The subject of ordering goods was thoroughly gone into and illustrated practically. That is, the student was made to take up the same correspondence which he would have with the wholesaler or the manufacturing firms of the country, and actually ordered his goods. He was made to take the invoice that came in from such orders and calculate the exact amount due, and then draw his check, or draft, or note, or otherwise settle it, and he was shown how to protect his note at the proper time, if he made one.

Receipts, releases, bills and invoices—all these were explained to him.

Discounts (cash): This subject was very strenuously dwelt upon, and the student was taught the advantage of taking the cash discount whenever possible.

Then there was the subject of price-lists. A large number of price-lists was obtained from the manufacturers, and the student was made acquainted with them—so that if he wished to order one of Mr. Seabury's plasters, for instance, he would know where to get it and what the price of it was. [Laughter.]

Then, in a general way, the subject of the establishment of a business, the selection of a location and the general rules that apply to the same were gone into. For instance, the student was advised never to select as a site for a drug store a location opposite a cemetery. [Laughter.]

The buying of goods and the selling of goods were both taken up—that is, methods of buying and the sources from which goods come; the sale of goods over the counter, and the treatment of the customer in so doing. All these were treated in a general way.

Advertising was another subject taken up and explained as fully as possible.

The importance of taking an inventory was another subject that was discussed and insisted upon, and the various reasons given why an inventory should be taken. The importance of this, I am sure, is not realized by the average retail druggist. He may find from an inventory that he is eating up his stock and does not know it. That is frequently done.

Then the subject of bookkeeping, including a course in double-entry bookkeeping was taught. There is only one system, and that is double-entry bookkeeping—though, of course, single-entry may be used to advantage in certain ways. A special form of bookkeeping suitable for a retail drug business was explained. I endeavored to devise a plan to reduce to the lowest possible amount the actual labor of keeping the books, and still keep an accurate account of all the details of the business.

This practically concludes the subject. The result of my work during the past winter convinces me that this is a very important subject, and one that should be taught wherever possible.

Great applause followed the address of Mr. Ryan.

MR. NATTANS: I rise to move a vote of thanks to Mr. Ryan for his masterly exposition of the necessity of business training in our colleges of pharmacy.

Several members heartily seconded the motion, and it was carried unanimously.

MR. SHEPPARD: Before we commence the discussion of this very interesting subject, there is another paper which I think should properly be read now. The Chairman of the Committee on Practical Pharmacy and Dispensing has asked me to bring before this Section a request that he be given time to present the committee's subject at this morning's session of the Commercial Section, and as the committee's work is directly in line with the subject presented so ably by Mr. Ryan, I will ask the Section to give Mr. Hynson an opportunity to be heard at this time, and I move that he be allowed to do so.

Mr. Voigt seconded the motion and it was carried unanimously.

MR. HYNSON: Gentlemen, I consider this a privilege. Our report is rather a lengthy matter, and if at any time the Section wants to take a rest I shall not be sensitive about it, because it may be a little more than should be given to you at one time.

Mr. Hynson then read the report:

REPORT OF COMMITTEE ON PRACTICAL PHARMACY AND DISPENSING.

Mr. President and Gentlemen: The second step of this Association's youngest child is made, and while it stands thus uncertainly balanced we anxiously wonder whether or not it will be able to proceed, and ask: Has this last effort been wisely enough made to enable the weakling to go on, gaining its own as well as its mother's confidence and respect with each successive step, until it shall finally be given a creditable place among Sections and become a useful member of the household, or will it topple, fall, and, with its first feeble efforts, be lost in the great sea of unsuccessful experiments? Certainly firm was the mother's support and assuring was the mother's encouragement given to its first venture. Kind, indeed, were the plaudits provoked by the initial performance of this Committee, so kind that the youngster trembles lest too much is expected now.

In sober earnestness, the Association must feel encouraged because of the cordial reception vouchsafed this movement, made, as we know, to interest more of our members in the actual doings of our meeting. The pharmaceutical press has been universally commendatory, delegates from State Associations have added their praise in the reports they made to their several organizations, and individuals in large numbers have written strong letters of approval, There seems to be but little doubt about the need of such a department; there is certain evidence of a growing interest in such work, and we are amply assured that a large number of our members wish it continued; yet, withal, there is a sad lack of active support, and the Committee is compelled to report the receipt of less papers even than came to it last year. Discouraging, indeed, is this, since it follows an appeal most earnestly made, the strongest and best we were able to pen.

This plea was sent out in circular form with the Proceedings, a method which, by actual trial, compares very unfavorably with the more expensive plan of addressing indi-

vidual and special letters to each member supposed to be interested. We report smaller expenditures than were made last year, also smaller results. With the experience the two years give to guide us, we are led to believe that more time, energy and money must needs be given to this new enterprise to make it useful.

Practice and efficient leaders are every whit as much in place in this Association's undertakings as they are in campaigns upon which nations stand or fall, nor can we be too grateful to the officer or corps that brings success along any line. We are confident that usefulness in this special direction, as well as in any of the several Sections, is very largely dependent upon the personality of our leaders. We need to be taught *how* to work and what to attack. Each member should be known and should be assigned a duty best suited to his individuality. Wise and careful treatment does this undertaking require to bring, through it, satisfactory results. It must be judiciously directed by the Council, in whose hands its future rests.

Passing on to the specific work undertaken by your Committee, we present the conclusion that no better plan can be followed by us than that adopted by our predecessors. The effort plainly made last year to establish the fact that the notes of the calamity howler were misleading, should be continued. Alarms of warning must always be heeded, but the pessimist is a pest, indeed, and perverts the truth. It seemed to be fairly well proven by the Committee last year that skilled pharmacists could, if they would, find much to do; and this year, we, following their example, seek to show that in the every-day shop-work there are many difficulties to be solved, many questions arising that have not yet been answered. There are, also, many well-established principles and practices that are still, in the face of all the teaching and all the writing, poorly understood, if even known, by many practising pharmacists.

To forever effectually disarm criticism, let us say that our efforts have been directed specifically toward the simpler, more elementary parts of pharmaceutical practice; striving to show that it is just here that we may find much of profitable interest.

While we apologize to our more scientific members for this intrusion, for this introduction of the strictly practical, we venture to advise them that the science belonging to a system which does not have as its first, its chief object, the uplifting of the whole, is misapplied, or, at least, is improperly connected. True science, we think, seeks to give understanding to knowledge, and to establish truths as the foundation for already accepted theories. Such as this becomes helpful, consequently, desirable.

Besides sending out the circulars with the Proceedings, we have mailed five hundred return postal cards to the members, as far as that number would go, beginning with A, and following the list alphabetically, omitting, as far as we knew, all those not actually engaged in dispensing. The cards read about as follows:

"In the interest of 'Practical Pharmacy and Dispensing,' kindly select, out of the last twenty-five prescriptions you have filled, the one that required the most pharmaceutical skill, the one that gave you the most trouble and annoyance, or the one that was the most difficult to prepare. Copy it on the return card attached, and mail. If possible, add note, stating any peculiarity of manipulation followed.

"Fraternally yours,"

At this writing we have received, in all, ninety-five replies, sixty-eight of which brought copies of prescriptions; the others were of various import.

If the Association pleases, we will attempt to analyze the replies, taking up both classes, in a manner which, to our minds, will present their most instructive and helpful features profitably to our membership. To our utmost ability will we do this, yet we are confident that when we shall have finished, little will have been said as compared with the unlimited comment these cards might have provoked.

Shall we pass unnoticed the fact that less than twenty per cent. of those who received cards sent replies? Yes; more than four-fifths failed to return them at all! We will

not attempt to suggest reasons for this; we are sure they are many and varied. No matter what they may have been, we will not believe that any discourtesy was meant to this Association. We trust those who forgot us were all too busy to copy a prescription, as we believe many were, or thought they were. Regard this showing as you may, it indicates pretty clearly about the percentage of our members who have any interest at all in what is going on, pharmaceutically, beyond their doors.

To twenty-five gentlemen and one lady, who were courteous enough to reply for courtesy's sake alone, we are greatly obliged. None of these were wanting in interest, many approved the effort. Of these, six had retired from business and their replies in some instances were pathetic indeed; noble old men quietly, bravely waiting for the end. Let us not forget our elderly members; those who, because of infirmities consequent to old age, are unable to be with us. It would seem well to cultivate the fraternity idea a little more. We have done well in this line, let us do better and look up the dear old members in "the sear and yellow leaf," almost ready to fall.

Two of our friends had become wholesalers, one a teacher. Seventeen could find nothing of interest to report; while five of these and two who had also sent prescriptions, complained of the "proprietary" evil, commenting upon it with force and with something like bitterness. In truth, it is a growing evil and needs our most potent influences directed toward its curtailment.

Of the seventy-eight prescriptions received through the kind courtesy of sixty-nine members, fifty-two were for mixtures; eight for hard capsules; five for suppositories; five for pills; three each for ointments and powders; one each for a dusting powder, konseals and soft capsules.

It plainly appears then that mixtures present more than half of the difficulties that come to the average dispensing pharmacist. This is largely due, no doubt, to existing incompatibilities, but quite as often, perhaps, to the fact that bad prescribing and indifferent compounding can not be so easily obscured here as elsewhere.

A careful examination of the prescriptions for mixtures, reveals at least twenty-four actual incompatibilities. As the sixty-nine cards represent sixteen hundred prescriptions, this would indicate that not less than three of every two hundred prescriptions present incompatibilities. This, however, is the lowest possible estimate that can be made from these figures and will not correspond with deductions allowable from another part of this report. Fourteen of these incompatibilities may be classed as chemical and ten as pharmaceutical. In the latter appear all those due to the use of improper solvents or to the change of solvents, through admixture. It will be well to note, also, that of the chemical changes, eight are caused by reactions between strictly inorganic substances and six by the action of an organic upon an inorganic compound. In no instance does the combination relate to organic chemistry alone.

Twice are effervescent mixtures found which require careful handling. One was the familiar bismuth subnitrate and sodium bicarbonate combination, the other was of rhubarb and sodium bicarbonate. Since these are of comparatively frequent occurrence, note should be made of them by the inexperienced.

In one instance was the good office of glycerin apparent in assisting in the dilution of an alcoholic fluid extract, and once again was another of these troublesome fluid extracts noticed. Indeed, no other class of preparations are so fruitful in annoyance to the dispenser and as often reflect upon the pharmaceutical knowledge of the prescriber as fluid extracts. Their decadence is justly deserved and an acceptable substitute would be intensely popular.

Our investigation emphasizes the fact that the chemical and pharmaceutical characteristics of iron and its compounds should be well understood by physicians and pharmacists. This element and its salts seem to provoke more prescription difficulties than any other. Six times did the official phosphate or pyrophosphate give our correspondents

occasion to use their more scientific pharmaceutical attainments, and in four instances did the difficulty occur because of the presence of phosphoric acid. It is quite evident that full knowledge should be had by the dispenser of the different forms of phosphoric acid and of the peculiar relation of these to the official iron phosphate and pyrophosphate respectively.

Salol, because of its insolubility in water, and because it is difficult to powder in the ordinary way, appears in ten per cent. of the mixtures as a difficult substance to handle. Once it was fused with almond oil and emulsified, in another instance it was, strangely enough, dissolved in oil of wintergreen and emulsified. The unauthorized use of a considerable amount of the essential oil was the more peculiar because as much oil of turpentine was prescribed as there was oil of wintergreen used. The committee offers the information that salol can be more readily powdered after it has been fused and cooled. In this more finely divided state it can be easily suspended in mixture by the proper use of acacia or tragacanth.

By some of our correspondents the solution of pepsin is offered as a process requiring skill. This is true, yet the quality of the pepsin is often an important factor. Greater familiarity of physicians and pharmacists with the more concentrated liquid forms of this ferment with better assurances of their equal reliability would conduce much to the successful handling of this product. Its combination with alkalies, to which our attention has been called, is of such frequent occurrence and the oft repeated statements from physicians that most satisfactory results are secured from such, so-called, unscientific mixtures, leads your committee to advise our dispensing members to send out these combinations unquestioned; at the same time we suggest to our more scientific brothers the necessity of furnishing to physicians more convincing proof of their inactivity.

In four instances does the tincture of ferric chloride produce untoward effect; three times because of its acid reaction and once because of its immiscibility with mucilage of acacia.

Fowler's Solution evidently causes some annoyance to dispensers because it is frequently prescribed with acid more or less diluted.

These decidedly acid or alkaline reactions in galenicals so many times cause prescription difficulties that we must give them consideration. The ideal liquid preparation is one miscible in all proportions with water without being either acid or alkaline; and the nearer we approach the ideal, the nearer, of course, we approach perfect dispensing. It should, therefore, be a matter of serious concern to us to keep out of our standard formularies all new preparations save those that are neutral, and we should endeavor to reduce the number of such combinations already present; while those remaining should be so renamed as to leave no doubt as to their properties to the prescriber and dispenser, as, for example, acid syrup of squills, acid solution of iron, alcoholic, alkaline solution of arsenic, etc.

Your Committee is fully convinced, however, that Fowler's Solution is not nearly so difficult as it appears, since arsenic is soluble in sufficient amounts, under neutral, acid or alkaline conditions. Its alkalinity is not often in the way, save when the solution is prescribed in comparatively large quantities with such liquids as the tincture of ferric chloride, Majendie's Solution, etc. Rarely is it in such proportions as to precipitate ferric hydrate, and when added to an equal quantity of the stronger morphine solution, as has been observed, it must, naturally, be neutralized by an acceptable acid.

In four of the mixtures substances to assist in suspending insoluble powders had to be added, and with results satisfactory to the dispenser; but, the question as to how far, or when the compounder can take liberities in this direction, is a debatable one. Some plain rule regulating this should be made possible by that authority in whose province the power would seem to lie.

Three times only were proprietary preparations prescribed in these fifty-two mixtures. One was used twice, suggesting the propriety of including in the National Formulary at least recipes for an alkaline antiseptic solution and a mixture of recently precipitated magnesium hydroxide.

The omission of glycerin when prescribed with potassium chlorate and tincture of ferric chloride makes us ask, Was it to prevent an explosion? Time and time again have members of the Committee seen this combination dispensed without a mishap.

Four per cent. of the mixtures under consideration were so-called "emulsions." One illustrated forcibly an instance where skill and good judgment led the pharmacist to use the process of saponification to make a presentable mixture, when it is possible the prescriber had no such end in view. This raises a question in the minds of some members of the Committee as to the effect of the resulting combination as compared with the remedies as originally prescribed. Therapeutists and pharmacologists should settle this matter in a definite and scientific way. How does the physiological effect of an oleate compare with that of the substance decomposed to form it, and what is the changed medicinal effect, if any, of organic principles subjected to the action of strong alkalies? are questions worthy of practical settlement. When, and to what extent, is a compounder justified in using legitimate emulsifying agents? is also a question worthy of discussion, with the object of establishing a guiding rule well in view. The growing popularity of hydro-carbon oils for internal use, offers investigators the opportunity of suggesting the best means of forming emulsions of these, should they require modifications of the well established forms in use for fixed oils.

A reference to the old-time trouble with Basham's mixture by one of our friends suggests to your Committee the possibility of an obsolete formula for this solution having been used by him, although he seems to have satisfied himself that the trouble was due to "impure" chemicals. Such results described are, in the opinion of this Committee, more often ascribable to insufficient strength than to impurities. We take occasion just here to emphasize as forcibly as we can the great necessity of standardizing products before they are used in operations where definite chemical compounds are to result. Strangely enough, this very important matter is overlooked by many very good pharmacists. The present formula for Basham's mixture, including, as it does, glycerin, cannot be too highly commended. When fairly accurate ingredients are used the solution can be kept indefinitely, and we see no reason why it should not be made up in sufficient quantities to be kept on hand as any other permanent preparation.

A notable instance is presented, by one of the prescriptions received, of very odd quantities; prescriptions of the same character are met with so frequently that we feel justified in calling the attention of dispensers to the absolute necessity of acquiring a facile use of figures. The frequent and serious blunders resulting from inadequate mathematical knowledge is really appalling.

The failure to take advantage of the most valuable quality of honey to suspend a resin, dissolved in alcohol—tincture of guaiac—characterized one of the replies received, and leads us to make a point of this. Honey, straight honey, as is well known, is the very best substance to be found for making mixtures of tinctures of guaiac, benzoin, cannabis, etc., with aqueous fluids. When honey is present in quantities no less than the amount of the resinous tincture ordered, acceptable mixtures will result if the two are thoroughly triturated together before the other liquids are slowly added.

Endless, almost, would be the comments, we think, that could be made upon these two-score and ten prescriptions with profit, we believe, to some of our members, but we must pass on to another class, powders—powders, divided and in papers. Very few of this class were received, yet sufficient to suggest practical points of importance. Reiterating our words of apology, if necessary, we call attention to a simple trituration of calomel with milk sugar, one and a half grains to twenty. The compounder is directed to "rub

until a yellow color is obtained," and he remarks that the proportion of the mercurial is so small that no perceptible color can be procured. We are forced to ask: "Did he first triturate with a small quantity an equal bulk of the milk sugar, and if the yellow color then secured was not satisfactory to him?" Again: "Does he use this method always when triturating?" It is startling how many times we find pharmacists utterly disregard these fundamental principles of trituration, while others are as unmindful of the advantages one substance holds over another for this process. How many of us have seen a grain of strychnine added directly to a whole dram of quinine sulphate, when perhaps thirty grains of dried iron sulphate was to be a part of the same prescription? This is elementary, you say; we admit that it is, but we venture to assert that no fault in dispensing is more common than the one to which we have just referred.

Pepsin in powders, without drying material, but, on the contrary, with almost double its weight of ammonium chloride, leaves us with well defined ideas of the troubles following the dispensing of hygroscopic and volatile substances in papers. Of course waxed or some other impervious paper should be at hand, always cut in proper sizes. A recent experience of one of our members leads us to think that well-ground glass stoppered, salt-mouth bottles, of suitable sizes, are the proper containers for such powders.

The other prescription for powders calls for "guaiac" and created a doubt in the mind of the party receiving it as to whether the wood or resin was intended. As it also contains ammonium chloride and potassium nitrate, it brings up the question whether or not granular substances and very small crystals should be reduced to a fine powder when dispensed in papers, Seemingly a simple matter, yet when coupled with a want of knowledge as to the manner of administration, it adds another perplexity to the dispenser's living. If to be dissolved, the granular or crystalline form seems preferable. If to be taken dry on the tongue, or if insoluble, then the very finest form obtainable is to be preferred.

The five prescriptions for pills, kindly furnished us, clearly illustrate three types of difficult masses—phosphorus, one type, oils and oil-like substances one, and a non-reducible article, the third. It is a question if in even a small percentage of instances, the conscientious pharmacist is quite satisfied with his efforts in making pills containing phosphorus, notwithstanding he may be well informed as to methods, and may have had extended experience. Expert and accurate weighing, quick and careful manipulation, the least possible exposure; yet, after all, what does an estimate of the amount of free phosphorus remaining bring? It is just here, if never again, that we count ready-made pills a blessing, because the responsibility is shifted, wax and all. Tolu coating, often, as in this instance, suggested: What is our success in this operation? We read and read about tolu coating, and when we try it, we wonder if the writing is not all theory. Let us lend much encouragement to the would-be essayist on phosphorus in pills and on tolu coating, if his writings are to be based upon actual practice.

A member kindly sends a prescription of strychnine sulphate, arsenous acid, phosphorus and pepsin. He writes: "This required quick handling; dissolved phosphorus in chloroform, and after triturating other ingredients thoroughly, added the mixture to the solution of phosphorus, massed, made pills and coated with ethereal solution of tolu." The only thing omitted is a sample of the pills. This Association needs just such pertinent words and such an exhibit as these pills would make.

Essential oils and similar bodies are still used in pills, especially in emmenagogue compounds, and success in manipulating largely depends upon the quantity of oil prescribed or used. There is little doubt that soap is our most helpful aid in massing these, yet we are not warranted in using comparatively large quantities of soap. Experienced operators tell us that soap exerts its best influence when mixed directly with the oil the other articles are to be added to the paste thus formed.

Another writer and thoroughly practical member, commenting upon a prescription for

pills containing iron sulphate, strychnine sulphate, arsenous acid, powdered digitalis and creosote, one grain of the latter to each pill, writes as follows:

"Triturate strychnine sulphate and arsenic with five grains of milk sugar, add iron sulphate and digitalis; remove from mortar. Weigh creosote in homeopathic vial, pour in empty mortar and add powdered extract of licorice and kaolin, each twenty grains, rub together, add the mixed powders and glucose to make mass, which must be carefully "coaxed" into a pipe with the fingers and palm of hand. Cut with machine, but do not roll with it; form pills with fingers. Result, a satisfactory pill containing *all* the creosote."

The third mass represents that class where substances are prescribed that cannot without much labor or without skill be reduced to a uniform state. In this instance salol and resin guaiac are the only ingredients, and it offers an opportunity for the judicious application of heat, an element in manipulations as often overlooked as it is carelessly and ignorantly applied.

How much and yet how little have we written on pills, this varied and fruitful subject for practical work, and while it always stands inviting the attack of the sincere investigator, is scarcely more worthy of his skill than is the making of suppositories.

Of the four lots of suppositories presented, three demand skillful treatment because they contain chloral hydrate. Not one whit less troublesome has scientific or higher pharmacy made this prescription than it was to our elder brothers thirty years ago. Your Committee is led to ask why some special base has not been offered for suppositories of chloral. That nothing of the kind is well known is proven by the fact that cocoa butter is prescribed in each instance, and because each pharmacist employed a different method. One used "seventy-five grains of corn starch and a few grains of cocoa-butter to make mass" for six suppositories containing five grains of chloral each. Another rubbed the chloral hydrate (sixty grains) with twenty grains powdered tragacanth, proceeded in the usual way, using a slightly warmed spatula and shaping the suppositories by hand. The third operator, whose prescription contains sodium bromide one dram and chloral hydrate thirty grains in four suppositories, overcame the difficulty "by using a freezing mixture of ice and salt."

Two of these are from Washington, where, it seems, the President is not the only one who "has troubles." The other was from Boston.

The remaining contribution upon the subject of suppositories is a prescription for urethral bougies containing two per cent. protargol. With it is sent the following note:

"The base is a gelatin one, composed of gelatin, glycerin and water. The protargol is dissolved in one dram water, gelatin base melted on water bath and solution incorporated, then poured into bougie molds three inches long, which have been previously well dusted with lycopodium. About one to two hours are necessary to put up the prescription."

This latter prescription suggests to us the desirability of specific knowledge regarding the several new silver salts that are daily growing in popularity. No doubt valuable information could be furnished this association by its members upon this subject. The committee takes the liberty of calling attention to the fact that these compounds are hardly less sensitive to light than is the nitrate. This is known to have been frequently overlooked by dispensers.

The prescription also brings to mind indifferent urethral suppository moulds and the great difficulty of filling them, and leads us to give the method of a member of the committee: Moulds are used only for gelatin bases, and the dividable kind are preferred. These are slightly warmed and the cooling mass is poured over an upturned half, lying flat, in sufficient quantities to more than fill the moulds, the other half is then quickly put in place, and the two tightly squeezed together by strong screw clamps. With some little experience an operator can follow this plan so successfully as to have but the thin-

nest film between the mould, which can be easily and neatly pared off with sharp shears.

The chloral series of suppositories calls attention again to the questionable propriety of adding foreign substances to prescriptions, suggesting the possibility of retarded effects. A member of the committee was some time since criticised by an intelligent and observant physician, because five per cent. of wax had been used in suppositories of morphine when the thermometer was several degrees above ninety. The doctor declared they would not liquefy in the colon if they could not be made to stand the atmospheric temperature without wax. Then tendency of starch or tragacanth in this connection should be known.

Although a much younger class, capsules are none the less interesting. Their popularity is evidenced by the larger percentage of prescriptions received for them. More than twelve per cent. of the whole number submitted were for this modern introduction. Although they are described as "messy" by one of our correspondents, we must receive them as a three-fold blessing, helping physician, pharmacist and patient. They allow the prescribing of remedies otherwise out-of-the-question, make possible the dispensing of heretofore unthought-of combinations, and finally, render the most objectionable dose entirely acceptable. God bless the man who invented the "empty capsule!" To him medicine and humanity owe homage of a kind almost equal to that paid the discoverer of anæsthesia, and yet, who knows his name or where he lived or died? His history would indeed be interesting.

The prescriptions for capsules in hand suggest several general and important questions which might be answered by our members with profit to all. Rules might be formulated touching the filling of capsules which would greatly relieve the uncertain position of the dispenser as he now stands.

Certainly the quality and solubility of the material used in the capsules should be above question. The source of gelatin and the manner of its handling should be within the knowledge of the manufacturer of these much-used receptacles for medicines. The style and finish is secondary, yet withal quite important. Of great moment to the dispenser are variations in weight. For rapid and accurate filling the nearest possible approach to uniformity in this particular should be secured. With this condition met, and the use of a capsule as a counterpoise, the most rapid and accurate filling can be secured.

Fellow members, express to your brothers your opinion upon the question of filling capsules—whether or not in every instance when they can be filled dry, it should be so done. If sometimes mass and sometimes dry, say when and why, and try to establish guiding principles. Did it ever occur to you that the time required to mass your powders, to divide and shape your divisions, to carefully wash your hands and introduce the ovoid, was far in excess of the time required to fill dry, weigh and carefully wipe off? Earnest advocates of the rival plans might have capsule filling "bees" with much profit to the pharmaceutic world at large. Upon two points, at least, we must all agree; we must not balk the purposes of the capsule by allowing the least particle of the intended contents to remain on the outside, and when massed, each division should present the same appearance, and should be of sufficient size to fill the capsule. Dusting powder should be used just as little as possible. Oh, what sights have we seen!—notwithstanding the fact that the non-graduate dispenser is now a *rara avis* with our generous eye toward him, while his full-fledged and strong-winged brother stayeth not always at home.

Seemingly of little interest are the three cards referring to ointments, yet, like almost every other prescription, each calls up some unsettled, some doubtful question. Each plainly proves how practiced, how quick, must be the judgment and action of the dispensing pharmacist; each proving, again, that success in this department of pharmacy is almost wholly dependent upon a knowledge of fixed principles and an acquaintance with general laws, rather than upon specific learning touching the point in question, since one

can never be prepared for the endless variety of complications successively presenting themselves.

Not peculiar to ointments, of course, is the prescription which leaves us, after all that either acquirement or experience can possibly give, still in doubt. Such a one is "Ung. Hydrarg. Ammon. Nit." Besides seeing the prescriber, there is but one possible solution of this difficulty, and that is a negative one. Yet it plainly tells us, that it is not the ointment of white precipitate that is wanted, because the doctor plainly writes "Ointment of Ammoniated Mercury (Nit.)" This negative answer, however, is hardly satisfactory.

But does not this order suggest to us, who have trudged wearily far along the way, that knack, experience, patience, and skill are required to prepare two very common ointments? The next one for balsam peru, liquid storax and ointment of zinc oxide, is scarcely less interesting. At once it creates a desire on our part to help our younger brothers. How long were we learning that nearly all the difficulties resulting from the use of balsam peru in ointments and suppositories, in the latter especially, were due to the rapid vaporization of its more volatile parts? And when did we learn, as our kind friend who sent us the prescription, that the liquid storax must be softened and rendered uniform by adding sufficient alcohol before mixing it with the base? Do not think you can melt and strain it. And ointment of zinc oxide, do the pharmacists generally know how to make it satisfactorily? Is yours and ours always what it should be? Twenty-five samples, promiscuously purchased, and critically examined, would make a very interesting, but I fear not a very creditable, showing for the higher pharmacy of today.

The last of the series is full of meat. It brings up the liquefaction of menthol and camphor when triturated together. It makes us ask: "Should oil of wintergreen be dispensed when methyl salicylate is ordered?" And lastly, it calls our attention to lanolin, its growing popularity, a Pharmacopœia substitute, and suggests another question: Should we, as directed on the can, "always add twenty per cent. of olive oil to lanolin before dispensing it?" If so, why does not the manufacturer add the oil and present the base in its proper form? Then, too, we are reminded that we can make a very desirable ointment base containing as much as sixty per cent. of water by using ten per cent. of oil of almonds and thirty per cent. of lanolin. If these three simple prescriptions for ointments offer so much of real practical interest, are we not too often overlooking the washings at our feet while trying to catch the first sight of the new ship that is to bring us glory and honor?

It would be wise, perhaps, to close this report without making reference to the three remaining prescriptions; each a representative of classes entirely distinct; types of classes that are daily enlarging; that are growing more and more popular. The formula for a dusting powder given us, seems an impossibility. It was sent without comment, and is as follows: Salicylic acid, one and one-half drachms; zinc oxide, two ounces; oil of cade, two and one-half drachms, "dust three times daily." More satisfactory ones of this kind are daily coming in, and no pharmacy can now get along without a set of small bolting-cloth sieves and assorted deep boxes with perforated inner tops to meet the requirements of such demands.

Konseals, while not near so popular as capsules, are being used considerably, and represent one per cent. of the prescriptions sent us. It would be both interesting and profitable to know if this form of dispensing is really growing in popular favor. If it is, more attention should be paid to its improvement. Both cachets and machine might be bettered; the first are too bulky and forbidding, and the machine unnecessarily expensive.

The last prescription to be noted reminds us how greatly a pharmacist may add to his reputation by acquiring the best methods for filling soft capsules, since they too are be-

coming more and more popular. Our contributor in this line offers an ingenious plan for dispensing a semi-fluid mass in this form. Oleo-resin male fern, one drachm; croton oil, one drop, and powdered kamala, forty grains, are to be mixed and put into soft capsules. The required quantity was "injected" into the capsules with a long-pointed glass syringe. They were sealed in the usual way, the manner of introduction alone being novel.

And now, if our purpose has not been discovered, if we have failed to awaken interest in what has heretofore been considered common-place, we are disappointed. We are quite sure we have not, in any way, exhausted the subject, however much we have extended our criticisms, and while we hesitate to go farther, we are led by the possibility of having it said that we have drawn from a selected lot of samples to beg your indulgence a moment more, that we may make an effort to set such criticism at rest.

With three complete series of twenty-five prescriptions each before us, one in summary and two in detail, we are able to say that much more can be presented from any series than has yet appeared.

Be it understood that these data come from localities widely apart, and from members busy for themselves and busy for the Association. The three series were made up of the following, and compare as shown: Mixtures occur 10, 11 and 13 times; pills, 1, 2 and 0 times; capsules, 4, 0 and 6 times; powders, 4, 5 and 1 times; suppositories, 1, 0 and 0 times; ointments, 0, 0 and 3 times; soft capsules, 0, 0 and 1 times; proprietaries, 6, 6 and 1 times. Ten times in each series of which we have copies are found such active agents as strychnine, nitroglycerin, morphine, etc., either to be dissolved or carefully incorporated. Almost every process known to pharmacy has to be used in compounding these fifty prescriptions, and in fully forty cases disastrous, if not fatal results might follow the unskillful compounding of them.

A thorough consideration of these copies seems to prove that the several correspondents, who said they found none of their filling had required skill or care, judged superficially.

As we close this report, perhaps too long drawn out, we would earnestly plead for a closer contact with the actual practice of pharmacy. As the physician strives with unselfish direction to prevent disease, so must we strive, with a purpose as high as his, to prevent abnormal prescribing, thereby leaving more of time and force to be applied to higher development. But, since he cannot entirely prevent disease, nor we lead to the forming always of harmonious combinations, we must, as he has, fit ourselves for the hour's emergency.

Pharmacy has kept close pace with other sciences and professions in the teaching of its parts, yet far behind all is it in giving the highest type of education, which has for its dearest ambition no less an object and yet no greater object than the giving of the facility to successfully apply that which has been learned.

Study and value the *medical clinic* as its real worth demands, then turn about and, while facing pharmacy's greatest need, summon the combined and accumulated ingenuity of its best and truest friends to assist in establishing for it, for pharmacy, the one foundation upon which its fairest ideal can be built.

Respectfully submitted, HENRY P. HYNSON, *Chairman.*

Great and continued applause followed the reading of the paper.

MR. HALLBERG: I do not know whether there is time to discuss the contents of this paper this morning, but I think it should be discussed now if there is time, and I would like to say a few words on this subject.

Mr. Hynson has brought out a number of things concerning pharmacy as it is practiced which, I think, we should take into careful consideration. He has not exaggerated

the carelessness with reference to some of these forms — even as to so simple a form as trituration. I do not know what objection he had to the tolu-coating of phosphorus pills. I think that coating answers very well, provided, of course, you don't apply any heat to it.

But what I am more particularly concerned in is bringing before this Association the rather doubtful position of the pharmacist — and also the physician — with reference to the vehicles that we are to employ in the solid mixtures. As, for example, in the case of the ointments, and in the case of the capsules. It seems to me that we should have a clear understanding as to what principles should govern in the preparation of capsules. I think it should be clear that whenever a mixture is ordered in a powdered form, to be put in the form of capsules, that such mixtures should not be massed—that only when it is intended for intestinal use it may be massed, or when it is ordered in the pill forms. For example, capsules of calomel and bismuth sub-nitrate that have been massed with glycerite of starch forms in the course of a year a mass as hard as cement, making a little rod, so that the capsules can be taken off and used again. I think when the mixture is intended for use as a pill it should be massed, but otherwise not.

MR. HYNSON: I would be very glad for the discussion of this paper to be waived, and that Mr. Ryan's address be discussed.

MR. HALLBERG: You have stirred up the animals now, and you can not get rid of them as easily as that.

Now with reference to these external forms of solids: I have for several years past paid some attention to these subjects, and I believe that both physicians and pharmacists are at sea with reference to the solids for external use, and, inasmuch as the particular use governs the particular vehicle employed, necessarily the vehicle is a very important factor.

I believe the Vienna school, which is an authority for genito-urinary work, states it as a principle that anything intended for rectal use — that is, a rectal suppository — should have a fatty vehicle, and consequently, an animal or vegetable oil should answer the purpose admirably. But when intended for the vagina or the urethra that the vehicle should be of a mucilaginous character; that the secretions of these organs being of an acid character, and not mixing well with the fatty oils, a gelatin mixture, or agar-agar, which are excellent vehicles for the bougies and vaginal suppositories, should be used.

With reference to the ointments, they may be divided into three general groups—protective, sub-dermic and systemic, and these effects are obtained with reference to the particular vehicle employed. If we desire simply to have a protective effect, a non-absorbable fat, such as petrolatum, is the thing to use; if for sub-dermic use, animal and vegetable oils are the proper thing; if we want a systemic effect, we should use an absorbable fat, lanolin, which permits ready absorption.

I believe that a great deal of the present proprietary evil in all these mixtures comes about from the fact that neither the pharmacists nor the physicians have a clear insight into the differentiation, from a physiological and therapeutic standpoint, of these preparations, and I believe the Pharmacopœia could do no better work to popularize the official preparations than to take up these thereapeutic preparations in a general therapeutic sense—that is, with reference to the ointments and suppositories, and the like, such as I have referred to—and make these points clear. I believe the Pharmacopœia should recognize all these forms—capsules, cachets, wafers and tablet triturates—and give a definition as to what they shall be, so that when these manufacturers begin to exploit their various preparations under these well known titles, and they are not in conformity with these definitions, then the pharmacist will have a right to go to the physician and show him just what is being done. He has got the Pharmacopœia definition there, and he can say, this preparation is not a scientific one. I believe that idea ought

to be incorporated in the next Pharmacopœia; I believe that it would make the Pharmacopœia more valuable to the physicians and pharmacists of this country than any other feature, and would answer the special purpose of giving the pharmacist a better opportunity to practice his art in this extemporaneous compounding, which is so ably and well presented by Mr. Hynson and his committee. [Applause.]

THE CHAIRMAN: This is an inexhaustible subject, gentlemen. If there is anything more to be said in regard to this paper or Mr. Ryan's talk, you will kindly be brief.

MR. SHEPPARD: I want to say a word as to the address made by Mr. Ryan, and call attention to the fact that this paper—or address, rather—demands special attention. It is a new departure, a radically new thought, and I think we should consider it very carefully—especially those gentlemen connected with the colleges; and I hope they will carry home with them these thoughts presented by Mr. Ryan. I feel that his address is one of those things that deserve to rank among the highest ideas presented to this Association. It is impossible to discuss the matter in detail, because, as Mr. Ryan said, the difficulty with the subject is, that it is of so voluminous a character that the person who handles and begins to work on it will find himself overburdened with material, and the question will be one of selection only, and not a question of finding sufficient material to engage his attention. I want to emphasize the vital importance of this new, valuable, radical departure brought before us to-day.

THE CHAIRMAN: What is the pleasure of the Section on the report by Mr. Hynson on Practical Pharmacy and Dispensing—the report of that committee?

Mr. Sheppard moved to receive and refer for publication. Carried.

THE CHAIRMAN; The next thing in order—unless we have something more to bring before this Section—is the nomination of officers for the ensuing year.

MR. RYAN: Mr. Chairman, I take very great pleasure in nominating the present Secretary, Mr. Rapelye, of Hartford, Conn., for Chairman of the Section on Commercial Interests. [Applause.]

Mr. Hallberg seconded the nomination.

MR. THOMPSON: I take great pleasure in naming the present incumbent for re-election as Chairman. He has made a very acceptable officer of this Section, and I hope we can persuade him to serve another term.

THE CHAIRMAN: The Chairman is very much obliged to Mr. Thompson for his kind words, but I have already told several gentlemen that I cannot serve another term, and I hope my name will be withdrawn.

MR. STEDEM: I move then that the nominations for Chairman be closed, and that the present Chairman cast the affirmative ballot of this Section for Mr. Rapelye for Chairman of the Section for the ensuing year.

The motion was seconded and carried.

The Chair announced that that very agreeable duty had been performed.

Mr. Hopp nominated F. W. Meissner, Jr., of Indiana, for Secretary.

Mr. Sheppard nominated Mr. Stedem for that office. Mr. Meissner seconded the nomination, and asked that his own name be withdrawn,

but the Chairman stated that the names of Mr. Meissner and Mr. Stedem were in nomination for the office of Secretary.

Mr. Hopp moved that the nominations be closed. Carried.

The Chair appointed Mr. Hynson and Mr. Gayle tellers to collect and count the vote. These gentlemen performed the duty assigned to them, and the Chair announced that the result of the ballot showed that Mr. Meissner had received 32 votes and Mr. Stedem 20. On motion of Mr. Sheppard, the election of Mr. Meissner as Secretary of the Section was made unanimous.

The Chair appointed Mr. Caspari and Mr. Hallberg a committee to conduct the newly-elected officers to the Chair.

THE CHAIRMAN: I will say this, that the Committee on Commercial Interests consists of five members, and it seems to me that it would be appropriate for us to receive a motion here now that these two gentlemen who have been elected be allowed to select their associates—unless we are prepared to name them now—and report them to the General Secretary for publication. If they are to be elected, then we must proceed to their election.

MR. CASPARI: Article II of Chapter IX of the By-laws says the Committee on Commercial Interests shall be elected, and hence there is no choice in the matter.

Mr. Mayo moved to proceed to the election of the three remaining members of the committee, and the motion prevailed.

Mr. Whelpley nominated F. W. Stedem, of Philadelphia.

Mr. Mayo nominated Henry Willis, of Quebec.

Mr. Hallberg nominated F. E. Holliday, of Kansas City.

MR. HOLLIDAY: I think, gentlemen, it would be well to appoint somebody else, and not take a new man from the high-grass district.

Mr. Ryan, seconded by Mr. Seabury, moved that the nominations for committeemen be closed, and it was so ordered.

Mr. Thompson moved that the Secretary cast the affirmative ballot of the Section for the three nominees, and the motion prevailed.

The Secretary announced that he had performed this duty, and the Chair declared the gentlemen elected accordingly.

MR. MEISSNER: I would like to call up the resolution presented by Mr. Stedem yesterday, on which action was delayed.

THE CHAIRMAN: The installation of officers is now in order, and you will have to make a motion to suspend the regular order.

Mr. Meissner so moved, seconded by Mr. Whelpley, and the motion prevailed.

MR. MEISSNER: I would like to call up the resolution introduced at yesterday afternoon's session, which was not acted upon owing to the shortness of time, but which was intended to be brought up before this session.

The Secretary read the resolution as follows:

Resolved, That this Association cordially endorse the work of the National Association of Retail Druggists and the plan proposed by their Executive Committee to lessen the evil of price-cutting on proprietary medicines.

Mr. Mayo moved to amend by resolving that this Section *recommend* the passage of such a resolution.

MR. SHEPPARD: I don't think Mr. Mayo is quite right in this. This is the place where it should go through. The only thing we can refer to the general Association is matters of finance and such matters as that.

MR. MAYO: I agree with Mr. Sheppard, but I am in accord with the ruling of the Chair in this.

The Chairman ruled that this should be recommended to the Association in general session.

MR. MEISSNER: I do not see any reason why this Section cannot act on that resolution and endorse it if they see fit, and refer their action to the general Association.

THE CHAIRMAN: This is my idea. Of course, I do not wish to cut off action by this Section. But it would add dignity to it to have it referred to the general session, after this Section is through with it, I think.

The motion to recommend the endorsement of the work of the National Association of Retail Druggists for the special action of the Association in general session was seconded by Mr. Ryan and carried.

THE CHAIRNAN: We will now proceed to the installation of officers, and Mr. Hallberg and Mr. Caspari will please conduct the newly-elected officers to the Chair.

These gentlemen performed that duty, and Mr. Caspari said:

Mr. Chairman, we have pleasure in presenting to you the newly-elected Chairman of the Section, Mr. Rapelye, of Hartford, Conn.

THE CHAIRMAN: I congratulate the Association and you, Mr. Rapelye, on the selection made, and I want to say that I have found Mr. Rapelye admirably adapted to the work. He has given me valuable assistance, and he will no doubt prove to be just the right man for the place to which you have elected him.

MR. RAPELYE: I thank you for your endorsement, gentlemen. The work of the Commercial Section is of considerable value to the Association and has considerably more in it than the matter of cut prices, and I hope the good work will go on along the lines we have undertaken, and that the Section will accomplish the work it is capable of doing.

Mr. Caspari introduced Mr. Meissner, of La Porte, Ind., as the newly-elected Secretary of the Section.

Mr. Meissner said:

Fellow-members of the Section, I thank you for the honor conferred upon me. I can only say that we hope to make the Commercial Section quite as important a factor in

the American Pharmaceutical Association as the Scientific or Educational Section. I think that, with the Committee selected, we ought to do good work.

Mr. Caspari introduced Mr. Holliday and Mr. Willis, two of the three new committeemen, Mr. Stedem not being present.

Mr. Holliday said:

Gentlemen, I most certainly appreciate the honor of election as a member of this Committee. As a retail druggist engaged in the business for thirty-three years, I feel — or ought to feel — at home in this body of men. Mr. Willis and I are both working druggists, and we will do all in our power to make the Commercial Section of the American Pharmaceutical Association the success it deserves to be.

Mr. Willis: Mr. Chairman and gentlemen, I thank you very much for the honor you have done me in electing me a member of this Committee. I recognize it as a compliment to the Dominion I represent. I will do my best to make the Committee work a success.

Mr. Ryan moved to dispense with the reading of the minutes.

Carried.

Mr. Mayo moved a vote of thanks to the retiring officers for the efficient work they have rendered the Section.

The motion was seconded by Mr. Hallberg and carried unanimously.

On motion of Mr. Ryan, the Section then adjourned.

MINUTES

OF THE

SECTION ON SCIENTIFIC PAPERS.

FIRST SESSION—WEDNESDAY AFTERNOON, MAY 9, 1900.

The Section was called to order at 3.15 p. m., by the Chairman, Mr. F. G. Ryan.

The Chair announced that the first order of business was the reading of the Chairman's address, and he asked the Secretary to take the chair while that was being done.

Mr. Mayo took the chair, and Mr. Ryan read his address as follows:

CHAIRMAN'S ADDRESS.

The present year (1900) marks a period in the passage of time, when, in whatever occupation one is engaged, it seems especially fitting and proper to pause for a moment and consider the work of the past, and by such reflection we should profit in the future. For the coming century the year 1900 will form the dividing line between the new and the old; in the past those who have preceded us have looked upon the year 1800 as the beginning of an era of new ideas, so in the future the present year will be considered the time of a new beginning, but with the added impetous of the years of study and labor which have preceded it. We should, therefore, feel much encouraged and forecast for the future a most brilliant development of the hidden truths still locked up by nature.

Although this Association cannot lay claim to full one hundred years of life, it may with truth be said to have attained an age of honorable and sturdy manhood, and its part in the development of science has been both brilliant and of lasting benefit to mankind.

There are among us active members to whom the scientific achievements of this Association in the past are still fresh in mind, but many of our younger members are unacquainted with the work that has been accomplished by the unselfish labor of the many earnest men who have honored this Association with their presence, and who have contributed to its records lasting monuments of their interest and zeal.

By reference to the published Proceedings we find that the founders of this Association had in mind the preservation of the scientific welfare of pharmacy, and while the result obtained may not be as great as was anticipated, there is no doubt that to this Association belongs the credit of fostering and developing the scientific part of our calling and preventing the occupation of the pharmacist from becoming merely that of a merchant.

The first recorded scientific work by members of this Association is embodied in the

report of the committee appointed to arrange standards for the admission of drugs to the ports of the United States. In this lengthy report we find standards suggested for many drugs, and to obtain such standards much scientific investigation must have been necessary. We here find the germ which has given us to-day, after nearly fifty years of growth, the many processes for determining the purity and strength of medicinal substances employed for the alleviation of human suffering. There is still much to be done, and as in the past, so to-day we have among us those willing to devote their time and labor to this valuable work; to-day we find the subject of standardization one of greatest interest, and which, at a future time, will undoubtedly give us exact knowledge on many subjects which are now clothed with uncertainty.

As early as 1858 we find a report of a committee delegated with the work of preparing an unofficial formula, the object of which was to retard quackery and dignify pharmacy as a science: here again, we see the birth of our present volume "The National Formulary," and by comparison one would be blind indeed did he not discover the grand and rapid progress made in those sciences which pharmacy comprehends; a knowledge of which must have been possessed by the members to whom this work was delegated.

In various revisions of our national standard, the United States Pharmacopœia, we again find our members taking active part, and almost wholly to their unselfish labor is due the scientific character of the information therein contained.

Early in the history of this Association we find a proposed syllabus for the study of pharmacy, its object being to supply a systematic method of study for aspiring pharmacists, and in this syllabus is the foundation upon which our colleges and schools of pharmacy have built their superstructure. At that time there were but four or five institutions teaching pharmacy, to-day we have more than ten times that number engaged in the work of the education of pharmacists on a scientific basis, and we may say with truth that this Association has, since its birth, given to these institutions all aid and encouragement within its power.

In the adoption of the metric system of weights and measures in our Pharmacopœia of 1890, we see the result of the long and patient labors of our members and the report of our former committees on this subject, nor is it unreasonable to predict that in this action the entering wedge has been supplied, which in the future will relieve coming generations of the trials and tribulations of the heterogeneous systems of weights and measures we ourselves have endured. Our action in regard to this subject was no doubt an important factor in shaping the course of our British friends, and in so far as official pharmacy is concerned, we may now call the metric system the universal system of weights and measures.

In reviewing the printed Proceedings one is struck with the vast amount of scientific knowledge contained in the various reports on the progress of pharmacy, placing at our command the results of the scientific workers in pharmacy the world over. What an opportunity is lost by those unacquainted with its value, and by reference to its pages many otherwise perplexing problems may be solved, and what has appeared to be a new difficulty is found to be an old one for which a perfect diagnosis has long been resting within these volumes.

The attention given to the subject of adulteration and the many papers relating thereto are certainly bearing fruit in the pure food and drug laws of our several States, and would it be claiming too much to say, that our membership has contributed largely to the forces which have caused this action to be taken?

A few of the special investigations of scientific character, as work of our members, are worthy of notice. The study of percolation and the papers contributed by such men as Procter and Grahame, not to mention the work of those members still with us, have given to American pharmacy a place in history unexcelled by any nation of the world, and have made possible many products of inestimable value to mankind.

The constitution of the volatile oils furnished a subject for several papers by the lamented John M. Maisch in the years 1858–9, and from then up to the present we have found willing and scientific workers among our numbers steadily unraveling the mysteries of these complicated compounds. One might thus quote examples without number, but who among us, in the light of these facts, would say that pharmacy is not justly entitled to be called a scientific pursuit? Because there are those who masquerade under the title of pharmacist and thus seek to profit by this cloak, does not in any way lessen the honor and credit due those members of our profession who have devoted their lives to the solving of mysteries which give to the sick the means of alleviating their suffering and of the prolonging of their lives.

But what of the present and the future? By reference again to our records we find many changes. Formerly the scientific work of this Association was very largely contributed by men actually engaged in the practice of pharmacy; now we may note, that like all other occupations, specialism is the order of the day. Our investigations are made by those best qualified for a particular kind of work. We have our chemists, botanists and pharmacists, and these again subdivided, and each giving his attention and study to some particular branch of his chosen science, but it is the exception rather than the rule that we find the investigator still wielding the mortar and pestle.

In the opinion of the writer it is well that this is true, for to his mind it is beyond the power of one man to do well all things involved in the collection, preservation, investigation, and preparation of drugs, organic and inorganic, and at the same time conduct his business in such a manner as will insure to his family and himself sufficient for the common needs of life.

As in other occupations and professions, is not the division of labor, which characterizes the present time, a necessity in pharmacy, if healthy and progressive advancement is to be made?

In his address one year ago before this section, Dr. H. H. Rusby voiced the sentiments of this Association in an appeal for investigations in pure science. The present chairman echoes the same sentiments, but does not believe this should be the work of the retail pharmacist; his education should be so directed as to fit him for the practical application of the scientific truths brought to light by original investigators, leaving original investigation to those whose natural inclinations, ability and education fit them for advanced scientific research.

No one who is at all observant will fail to discover new truths in the practice of a calling so filled with science as is that of the pharmacist, and in a sense he becomes an original investigator.

It is in the placing on record of these facts and observations that the practicing pharmacist may contribute to the fund of useful knowledge. What appears to-day to be pure science, is found to-morrow to have become, in its application, common practice.

With a view of extending the usefulness of our Association, your Chairman would call your attention to a few subjects which, in his opinion, seem to offer fertile fields for investigation by our members. A recent paper by Mr. F. B. Kilmer, on the cultivation of medicinal plants, shows that but little attention has been given to this subject in our own country. With a knowledge of the progress made in the cultivation of cinchona and some other medicinal drugs, is it not probable that equal success may be attained with many of our indigenous plants? As our knowledge of the active plant constituents becomes more exact, it would seem quite within our power to control to a certain extent the production of such constituents in the growing plants. These investigations should become a part of the work of our Government in its Department of Agriculture. Indeed, we believe this subject of sufficient importance to this Association to warrant the appointment of a committee for the purpose of securing such investigations by the proper government officials at Washington.

With our Pharmacopœia rapidly becoming the legal standard for the purity and strength of official substances in the various States, our manufacturing chemists and pharmacists can greatly aid in establishing such standards as will be within the range of possibility in commercial manufacturing, and, at the same time, protect the public health. With the strict enforcement of our Food and Drug Laws many annoying prosecutions may occur, and persons entirely innocent of intentional wrong-doing be made to suffer.

With the rapid growth and extended use of modern synthetic remedies, the employment of serum therapy and antitoxins in medicine, it seems desirable that pharmacists should have a greater knowledge of the physiological action of drugs, upon which the manufacture and use of these compounds so largely depends. Papers upon this subject would prove of interest to this section.

In his address as President of the British Pharmaceutical Conference last year, Mr. J. C. C. Payne, quoting the eminent scientist, Professor Huxley, states that the latter declared "that he would abolish materia medica from the medical curriculum, and cannot understand the arguments for obliging a medical man to know all about drugs and where they come from." Evidence is not wanting that many of the physicians of our own country hold the same opinion. In the light of these facts there need be no fear for scientific pharmacy, and this Association will supply willing and able workers as it has in the past, to meet the emergencies as they may arise.

Hearty applause followed the reading of the address.

THE CHAIR: Gentlemen, you have heard the able address of our Chairman. What do you wish done with it?

Mr. Stewart moved to receive and refer to a committee of three, to take into consideration the suggestions made in the address. Mr. Hallberg seconded the motion, and it prevailed.

Mr. Ryan resumed the chair.

On motion of Mr. Prescott, it was ordered that the evening session of this Section adjourn at 10 o'clock, in order to give the members an opportunity to show their appreciation of the courtesy of the Governor and Mrs. Tyler in tendering the Association a reception at the mansion this evening.

THE CHAIRMAN: The next order of business is the reports of committees. There is a committee on the Ebert Prize. Is it ready to report?

MR. CASPARI: Mr. Chairman, the report of the Committee on Ebert Prize has been sent to me, so that it might be presented in the Scientific Section in accordance with the ruling of Chairman Rusby last year. Heretofore, it has been read in the general session first; but my attention having been called to the rule, it is accordingly presented here now.

Mr. Caspari then read the report:

To Members of the American Pharmaceutical Association,

Gentlemen: The undersigned Committee on the "Ebert Prize" beg to report that they unite in recommending that the prize be awarded to Messrs. Edward Kremers and Oswald Schreiner, for their paper upon "Nitroso Derivatives of Caryophyllene and Cadinene, and their Bearing on the Characterization and Classification of the Sesquiterpenes."

Respectfully yours,

W. SIMON, *Chairman*,
ELIAS H. BARTLEY,
A. B. STEVENS.

February 3, 1900.

Mr. Sheppard moved to receive the report and adopt the recommendations. Carried.

THE CHAIRMAN: The next order of business is the nomination at this time—but not the election—of officers of this Section for the ensuing year. The Chair is ready to entertain nominations for the offices of Chairman and Secretary of the Section.

MR. REMINGTON: I nominate Mr. Oldberg, of Chicago.

MR. HALLBERG: I second the nomination.

Mr. Lowe put in nomination Mr. Lyman F. Kebler, of Philadelphia.

There being no further nominations at this time, the Chairman announced that the Secretary would post the names under the rule, and that other nominations might be made at the next session.

The Chair appointed as the Committee on Chairman's Address, Messrs. F. E. Stewart, J. M. Good and A. B. Stevens.

The Chair announced that the reading of papers on scientific subjects was now in order, and Mr. H. M. Gordin being called upon, read the following:

APPLICATION OF THE MODIFIED ALKALIMETRIC METHOD TO THE ASSAY OF DRUGS AND GALENICALS.

BY H. M. GORDIN.*

In a previous paper† I proposed an exact method of estimating alkaloids with the aid of phenolphtalein‡ as indicator. As one of the important advantages of this method of estimation, it was pointed out that by removing the alkaloid by means of Wagner's or Mayer's reagent, most of the impurities and the coloring matter contaminating the alkaloid are also removed, so that the final titration is carried out upon a liquid which is perfectly colorless, and the end reaction can therefore be observed with all desirable sharpness. This advantage is certainly of great value in the alkaloidal estimation of crude drugs and fluid extracts, where it is almost impossible to obtain the alkaloids in a state of perfect purity without incurring considerable loss. How completely the coloring matter is removed, can be particularly seen in the assay of opium. As the morphine obtained in this case is not passed through the operation of shaking out with immiscible solvents, the alkaloidal solution in standard acid is considerably loaded with coloring matter. After the precipitation with Wagner's reagent and reducing the iodine by sodium thiosulphate, the solution is perfectly colorless. This reaction between some coloring matter and Wagner's reagent seems to be the reason of the somewhat high results obtained by the iodometric assay of opium as proposed at first by A. B.

*In the work of the Research Committee D, Section 2, Committee on Revision of the Pharmacopœia of the United States.

†Berichte d. deutsch. chem. Ges., 1899, 2871. Pharm. Arch., 1899.

‡Instead of phenolphtalein, any other good indicator may be used.

Prescott and myself.* The color of the liquid must also affect the end-reaction in the "dip" method as described in a previous article.† From the figures given below it will be seen that the modified alkalimetric method, when applied to the assay of opium, gives results which, being higher than those obtained by the U. S. P. method, are lower than those obtained iodometrically, as by the "dip" method.

In applying the new alkalimetric method to the assay of alkaloidal drugs and galenicals, it is of course immaterial by what methods the alkaloids are isolated, provided the isolation be complete and the alkaloids free from foreign bases. The method of extraction which was proposed by A. B. Prescott and myself‡ is certainly applicable to all crude drugs, and does not require much more time than many other methods. Digestion with Prollius' fluid when the drug is in very fine powder, is also very effective, though there is some danger of error by evaporation of the very mobile liquid. In case of those drugs which are not injured by the temperature of boiling alcohol,§ the best and quickest method of extraction is certainly the extraction by hot repercolation in a Soxhlet or any similar apparatus. The alcohol can then be reduced by distillation to a small bulk, and the liquid assayed as a fluid extract.

For the estimation by the modified alkalimetric method the free alkaloid obtained by any reliable method is dissolved in an excess of fortieth or fiftieth normal sulphuric acid, using gentle heat if necessary, the solution made up to a definite volume, filtered through talcum if necessary, and an aliquot portion of the clear filtrate taken for the assay. If the solution of the alkaloid in the standardized acid is not turbid from the presence of fatty substances, this solution can be used directly for the assay. For this purpose the aliquot portion, or the whole solution, is put into a measuring cylinder or flask, and Mayer's or Wagner's reagent is added in small quantities at a time, and shaking after each addition till a considerable excess has been added, the measuring vessel is then filled up to a definite mark, the liquid filtered and the excess of acid determined in an aliquot portion of the filtrate by means of standard potassium hydrate, using phenolphtalein or any other good indicator. If Wagner's reagent is used as a precipitant, the liquid must, of course, be decolorized with sodium thio-sulphate before titration with alkali.

In taking up the alkaloids with the standardized acid, it will be found that, owing to the weakness of the acid, some alkaloids like strychnine and hydrastine go into solution with considerable difficulty. In such cases it is best to shake the alkaloid, dissolved first in a little ether or a mixture

* J. Am. Chem. Soc., 1898, 724. Pharm. Arch. 1, 121.

† Arch. d. Pharm., 1899, 380. Pharm. Arch., Vol. 17, No. 6.

‡ J. Am. Chem. Soc., 1899, 232.

§ Possibly methyl alcohol would prove to be better than ethyl alcohol.

of ether and chloroform, with the standard acid, and then remove the ethereal layer by gentle heat or by a current of warm air.

In order to test the applicability of the new alkalimetric method to the assay of crude drugs and galenical preparations, three drugs and three fluid extracts were assayed. The acid and alkali were of fortieth normal strength and standardized with a sample of pure morphine as described in another paper.* The drugs assayed were opium, nux vomica and cinchona bark. The fluid extracts were fluid extracts of nux vomica, hydrastis (for hydrastine) and cinchona. These examples will, I think, be quite sufficient to show the applicability of the method.

DRUGS.

Opium.—The assay was carried out exactly as given in another paper entitled "Short directions for the assay of opium."

The opium assayed by the United States Pharmacopœia method contained 14 per cent. morphine, by the iodometric method about 17 per cent. were obtained.

	Fortieth Normal Acid consumed by one gramme opium.	Per cent. Morphine.
1.	21.8 Cc.	15.48
2.	22.1 Cc.	15.69

Time required to carry out assay, about two days.

Nux Vomica.—Eight grammes of the powdered (no. 50) drug were extracted for about two and a-half hours in a Soxhlet apparatus with alcohol, the alcoholic extract reduced to about 10 Cc. by distillation and then diluted with acidulated water to 50 Cc. The liquid was filtered through a little talcum powder and 25 Cc. (4 Gm.) of the clear filtrate, made strongly alkaline with potassium hydrate, shaken out three times with a mixture of three parts of ether and one of chloroform, using 25 Cc. each time. The united ethereal liquids were shaken up with about half a gramme of calcined magnesia. This completely removes the small quantity of water, together with traces of alkali contained in the ethereal liquid.† The ether-chloroform was filtered into a flask, 40 Cc. of fortieth normal sulphuric added, and after shaking the flask well, the ethereal liquid completely distilled off. The acid liquid was then poured into a 100 Cc. measuring flask, the distilling flask washed twice with 5 Cc. of water, and Mayer's reagent added, in small quantities at a time, till the reagent was in considerable excess. The flask was then filled up to the 100 Cc. mark, shaken till the supernatant liquid was clear, the liquid filtered, and in 50 Cc. of the clear filtrate the excess of acid determined by means of fortieth normal potassium hydrate and phenolphtalein.

*Ber. d. deutsch. chem. Ges., 1899, 2871; Pharm. Arch., 1899.

†If after treatment with calcined magnesia, the filtered ethereal liquid be shaken out with water, and the latter drawn off, the water is not reddened by phenolphtalein.

	No. Cc. $\frac{N}{10}$ acid consumed by 4 Gm.	Total alkaloids by mean factor 0.0091.
1.	11.5	2.64
2.	11.9	2.74

Time required for assay about 4 hours.

Chinchona Bark—Total Alkaloids.—Four Gm. of very finely powdered bark were digested with frequent shaking for four hours with 100 Cc. modified Prollius' fluid.* Fifty Cc., (2 Gm.), were drawn off, evaporated, the residue taken up with strongly acidulated water and filtered. The filtered liquid made strongly alkaline with KOH was then shaken out three times with ether-chloroform, and the assay finished exactly as that of nux vomica described above. For total alkaloids the mean factor of quinine and cinchonidine was taken, which for a $\frac{N}{10}$ acid is 0.0077.

	No. Cc. $\frac{N}{10}$ acid consumed by two Gm.	Total alkaloids by mean factor.
1.	16.2	6.24
2.	16.0	6.16

Time required for the assay about one day.

FLUID EXTRACTS.

The simplest and quickest method to assay fluid extracts seems to be the following: From 2 to 10 Cc. of the fluid extract are diluted with acidulated water to 50 Cc., the liquid shaken up with a little pure talcum powder and filtered. An aliquot portion of the clear filtrate can then be used for the shaking out with an immiscible solvent. In the case of Golden Seal the berberine is easily removed by means of potassium iodide. If an estimation of berberine also is desired, the fluid extract is evaporated on powdered glass, and the residue treated in the same way as the crude drug,† applying the alkalimetric method to the hydrastine and the potassiodide method to the berberine.

Fluid Extract of Nux Vomica.—For the assay 10 Cc. were taken, diluted to 50 Cc. with acid water, filtered and 25 Cc. of the filtrate made alkaline with KOH, shaken out three times with ether-chloroform, and the assay finished the same as that of the crude drug described above.

	No. of Cc. $\frac{N}{10}$ acid consumed by 5 Cc.	Total alkaloids by mean factor.
1.	10.1	1.84
2.	10.3	1.87

Time required for the assay about 2 hours.

Fluid Extract of Cinchona.—4 Cc. were taken, diluted to 50 Cc., filtered off 25 Cc. and shaken out, after making the liquid alkaline with KOH, with

*Lyons' Pharm. Assaying, 1899. Detroit, Nelson, Baker & Co.

† See Am. J. Phar., 71, 257, June, 1899; Arch. d. Pharm., 1899: J. Am. Chem. Soc. 21, 732–741.

ether-chloroform. The ethereal liquid was treated with calcined magnesia, and the assay finished in the same way as that of nux vomica.

	No. Cc. $\frac{N}{40}$ acid consumed by 2 Gm.	Total alkaloids by mean factor for quinine and cinchonidine.
1.	14.5	5.58
2.	14.1	5.43

Time taken for assay 2 to 3 hours.

Fluid Extract of Hydrastis—For Hydrastine.—To 10 Cc. of the fluid extract an acidulated solution of 3 Gm. potassium iodide in 50 Cc. of water was added, the mixture made up to 100 Cc., shaken thoroughly and frequently during 10 to 15 minutes and filtered. 50 Cc. of the clear filtrate were made alkaline with KOH, and shaken out three times with 50 Cc. of a mixture of benzene and ether (1 :3). The benzene-ether was then shaken up with a little calcined magnesia, filtered and the assay finished as the assay of nux vomica.

	No. Cc. $\frac{N}{40}$ acid consumed by 5 Gm.	Hydrastine.
1.	11.2	2.13
2.	11.5	2.18

Time 2 or 3 hours.

University of Michigan, Ann Arbor, Michigan, April 6, 1900.

Mr. Gordin, upon request of the Chair, alro read a paper prepared by himself and Mr. Prescott, entitled "Short Directions for the Assay of Opium," and exhibited and explained an extraction apparatus that he used in his experiments.

SHORT DIRECTIONS FOR THE ASSAY OF OPIUM.

BY H. M. GORDIN AND A. B. PRESCOTT.*

The Materials and Utensils for the Assay.—Opium in very fine powder. Powdered sodium chloride, such as is used for the table. An ethereo-ammoniacal mixture composed of stronger ammonia water (U. S. P.) and alcohol, of each 5 Cc.; chloroform (U. S. P.) 10 Cc., and ether 20 Cc. Benzene boiling at about 80° C. Chloroform (U. S. P.), 40 to 50 Cc. Fortieth-normal sulphuric acid and fortieth-normal potassium hydrate. Phenolphtalein test-solution. Solution of iodine in potassium iodide containing about one per cent. iodine and about one and a half per-cent. potassium

* In Research Committee D, Section 2, Committee of Revision and Publication of the Pharmacopœia of the United States. This assay process for opium employs the titration by standard acid *after removal* of the alkaloid, as proposed by one of the present authors for alkaloids generally, since the last meeting of American Pharmaceutical Association. (Phar. Archives, Nov. 1899; Ber. d. Chem. Ges., 32, 2871.) The hot extraction with chloroform separately proposed by us a year ago (Proceedings American Pharmaceutical Association, 1899, p. 269). Besides these two incorporated features this article is only a revision of the directions given on page 275 of Proceedings for 1899.

iodide. Solution of sodium thiosulphate containing about ten per cent. of the salt and having a neutral reaction. A small Dunstan and Short extraction apparatus (Proc. A. Ph. A., xxi, 33). A glass stopcock. A 6 or 8 ounce screw-top ointment jar having a bottom concave within. A small pestle just long enough to rest half upright within the jar when it is closed.

Directions for the Assay. — Weigh out two Gm. of the opium into the ointment jar, rub it by means of the pestle with a few Cc. of the ethereo-ammoniacal mixture to make a smooth paste, taking care not to smear the sides of the jar unnecessarily, then add about 2 Cc. more of the same mixture, so as to have the opium well covered with liquid, screw down the top, leaving the pestle inside, and set the jar aside five or six hours. After that time the jar is opened, about ten Gm. of sodium chloride thoroughly mixed in with the opium, and the open jar placed in a good current of air, stirring frequently with the pestle in order to prevent formation of lumps. In about an hour the powder will be nearly dry. The jar is then placed in a vacuum desiccator containing, besides sulphuric acid, a vessel of paraffin, and left there over night. The jar is then taken out, any lumps in the powder carefully crushed with the pestle, and the mixture transferred to glazed paper and then to the inner tube of the extraction apparatus, in the bottom of which a plug of cotton has been placed. The jar is rubbed out several times with small quantities of sodium chloride, the rinsings added to the tube, and having placed a plug of cotton and a piece of glass on the top of the powder, the tube is connected with the glass stop-cock by means of a short piece of rubber tubing, and, regulating the flow with the stop-cock, the opium is extracted with benzene by percolating very slowly until, upon evaporating 4 to 5 drops of the percolate on a watch-glass and taking up the residue with ten or twelve drops of very slightly acidulated water, no turbidity appears by the addition of two drops of Wagner's reagent. A current of dry air is then passed through the tube till the powder becomes dry, which can be seen by the light color that the powder assumes, or by the fact that the tube ceases to feel colder than the surrounding medium, the tube placed into the outer jacket and the apparatus then connected with a small round-bottomed flask containing 40 to 50 Cc. of chloroform, and the powder extracted on a water bath until the exhaustion is complete, about 2½ hours. Care should be taken that only a small surface of the bottom of the flask be heated, and that a layer of solvent be constantly on top of the powder. The chloroform is then distilled off, removing the last portion by blowing air into the flask, and the residue dissolved in 60 Cc. $\frac{N}{40}$ sulphuric acid by the aid of gentle heat. The solution is poured into a 100 Cc. graduated cylinder, the latter filled up to the mark of 100 Cc. and the liquid filtered, using a little talcum powder, if necessary. Fifty Cc. of the clear filtrate (= 1 Gm.), are put into a 100-Cc. measuring flask and iodo-potassium iodide solution added in small quantities at a time, shaking well after each addition, till the supernatant

liquid is *very dark red.* The flask is then filled up to to 100 Cc. and shaken till the supernatant liquid is perfectly transparent and dark red. The liquid is filtered, and in 50 Cc. of clear filtrate, after decolorizing it with a few drops of the thiosulphate solution, titrate the free acid with $\frac{N}{40}$ KOH, using phenolphtalein as indicator. Figure out the number of Cc. of the $\frac{N}{40}$ acid acid consumed by one Gm. of the opium and multiply it by 0.71. The result is the percentage of morphine in the drug.

The acid and alkali used in this assay can be standardized in the usual way. If *very exact results are desired,* the acid should be standardized with a small quantity of pure anhydrous morphine, proceeding exactly as in the assay, and the alkali then standardized by the acid.

The Chair called for the reading of a paper, as part of the same group, on "The Alkaloids of Bocconia Cordata," by Messrs. Paul Murrill and J. O. Schlotterbeck, which Mr. Schlotterbeck presented as follows:

THE ALKALOIDS OF BOCCONIA CORDATA.

PAUL MURRILL* AND J. O. SCHLOTTERBECK.

Bocconia cordata is a native of Japan but it has been successfully introduced into the United States where it is commonly known as Tree Celandine. It is a hardy perennial attaining a height of 4 to 6 feet and spreads rapidly. It first came to our notice three years ago when it slipped into the University gardens in some unexplained manner. The similarity of its leaves to those of Sanguinaria, and the color of the latex, together with other minor features, at once suggested the family characters of the Papaveraceæ and later led to the identification of the plant. The original plant and the seedlings of the following year were carefully nursed so that last season enough material had accumulated to permit of a preliminary research.

According to the Index Kewensis, Bocconia and Macleya are synonymous genera with preference given to the former, while Engler and Prantl make a slight distinction between the two. However, our plant is the Macleya cordata which Eijkman† investigated, but we shall adhere to the commonly accepted synonymy of the two genera and give preference to the name Bocconia cordata.

For the extraction of alkaloids several methods were tried. Fifty per cent. alcohol containing 2 per cent. acetic acid was used first and percolation continued for a week, at which time the percolate still gave an abundant precipitate with Mayer's reagent. Acidulated water gave scarcely better results. The best success was obtained by moistening the drug with ammonia water, drying in a current of air, and extracting with chloroform by hot repercolation. In this way the drug was speedily ex-

* Holder of the Frederick Stearns & Co. Fellowship in Pharmacognosy, 1899–1900.

† Rec. Trav. Chim., *3*, 182.

hausted, with a minimum amount of extractive matter, which is mostly eliminated when the residue is extracted with acidulated water.

Alkaloids were found in all parts of the plant that were examined, viz., in the fruit coats, leaf, and rhizome, being present in largest quantity in the last named.

The acidified aqueous and alcoholic percolates were mixed and evaporated to a resinous consistency, taken up repeatedly with acidulated (acetic) water, and filtered. The filtrate was completely precipitated with lead subacetate, again filtered, and the excess of lead removed by hydrogen sulphide. After filtration the solution of alkaloids was then evaporated to small bulk, taking care to keep only slightly acid. By this process of purification considerable alkaloid was lost by adhering to the lead precipitates.

The chloroform was recovered from the chloroformic extract and the residue taken up with diluted acetic acid as given below. The strong mineral acids cannot be used for the reason that their salts are very insoluble in water. The filtered acid solution obtained from the chloroform extraction is deep blood red; while that from the aqueous and alcoholic extraction is only slightly colored.

From the morphological relation of Bocconia to Chelidonium and Sanguinaria, it was natural to expect some of the alkaloids present in those plants to be found here also, and the expectation was fully realized. In his work upon Macleya cordata, Eijkman * isolated macleyine (protopine) and announced also the presence of sanguinarine (a colorless alkaloid giving blood-red salts), but it is almost certain that he made no study of the alkaloid, basing his statement entirely upon the blood-red color of the salts which he obtained. No mention is made by him of the presence of other alkaloids..

The separation of the alkaloids from each other is a very difficult and tedious process and is accomplished only by the judicious use of solvents and repeated crystallizations. The solution from the combined alcoholic and aqueous extracts was placed in a separatory funnel, and made alkaline with ammonia, when an abundant curdy precipitate separated. A considerable quantity of ether was added, and the whole thoroughly shaken, whereupon the alkaloid immediately dissolved.

The aqueous liquid was drawn off rapidly and the ether run into a crystallizing dish which was loosely covered, so that the ether might evaporate slowly. Crystals of two kinds begin to appear very rapidly; small opaque warts or sphaero-crystals and rather large transparent prisms frequently grouped in clusters. These two kinds of crystals may be separated quite easily by hand and purified by many recrystallizations. The small opaque warts may be purified by boiling with alcohol, in which they are very sparingly soluble, and then recrystallizing from alcohol-chloroform,

* Loc. cit.

or, if necessary, by dissolving again in acetic acid, throwing out with ammonia water and recrystallizing from ether. In their behavior toward solvents, strong acids and alkaloidal reagents, and in their crystalline form and melting point, these warts agree with the alkaloid protopine.

The rather large transparent prisms are purified by crystallizing from alcohol and recrystallizing from acetic ether, alcohol, or a mixture of the two. Their properties agree in every particular with those of β-homochelidonine.

The resinous extract from chloroform is warmed repeatedly with diluted acetic acid until the alkaloid is removed and the solutions filtered and evaporated to smaller bulk. The intensely red solution here obtained is not entirely due to sanguinarine, but in part at least to some other coloring matter which has not yet been examined. To remove as much of this as possible, the solution is placed in a separatory funnel, made strongly acid with sulphuric acid and shaken several times with chloroform. The sulphates of some of the alkaloids separate at this time, so that after shaking the mixed liquids they are separated by filtration with suction. The precipitated sulphates are washed with a small quantity of water, while the mixed chloroformic and aqueous liquids are poured into the funnel to permit separation of the latter liquid. The precipitated sulphates are dissolved in water and added to this aqueous liquid, made alkaline with ammonia water, and shaken out with ether as mentoned above. The protopine and β-homochelidonine come out together again as before, and can be separated by hand or by boiling with alcohol.

The mother liquors from all the crystallizations are mixed and all the washings (solvents) added, when it is allowed to evaporate spontaneously, keeping alcohol in excess. Protopine being practically insoluble in alcohol is completely deposited and finally a residue obtained that contains β-homochelidonine and other alkaloids and impurities. This is dissolved in glacial acetic acid with the aid of heat, and when cold is poured into twice its volume of water. A resinous precipitate was thrown down which we have not as yet examined. The red or orange-red filtrate from the resin is then made alkaline with ammonia water, shaken out with ether, and the ethereal solution set aside to crystallize. Large warty concretions, slightly pinkish in color, separate together with the characteristic prisms of β-homochelidonine. These are partially separated by hand but more completely by treatment with acetic ether, which dissolves everything but the warty concretions. These were then recrystallized from a mixture of acetic ether and alcohol and identified as chelerythrine by the melting point and by giving lemon-yellow salts.

If sanguinarine is present at all, it exists in such small amounts as to elude all efforts to isolate it from the amount of material at hand. If a blood-red color of the precipitated nitrate or sulphate is sufficient evidence of the presence of sanguinarine, then it is present in this drug as Eijkman states.

Protopine.—$C_{20}H_{19}NO_5$.

This is the most abundant alkaloid in the plant and constitutes nearly two-thirds of the entire alkaloidal content. It is described as white warty conglomerates, or transparent monoclinic prisms. The latter are obtained from alcohol-chloroform, while the former are usually obtained from all other solvents. It is not unusual to find both kinds of crystals, side by side, from the same solution. Protopine possesses the peculiar feature of being very soluble in ether when freshly precipitated, but very insoluble when in the crystalline state. The melting-point is variously given from 201°–207° C. As obtained by us in its best state of purity it melts at 204° C. uncorrected, or 208° C. corrected.

Protopine was first isolated from opium by Hesse * in 1870; in 1884 it was found in Macleya (Bocconia) cordata by Eijkman †; in 1890 by Selle ‡ in Chelidonium majus; in 1890–91 by Kœnig and Tietz § in Sanguinaria canadensis; in 1900 by Schlotterbeck in Adlumia cirrhosa (see Proceedings, 1900). It is also believed to be identical with fumarine obtained from Fumaria officinalis, a belief that is strengthened by finding the alkaloid in Adlumia.

Two formulas have been proposed for protopine, differing from each other by H_2. The figures obtained by Hesse, Eijkman and the authors agree best with the formula given above, while Schmidt accepts the formula $C_{20}H_{17}NO_5$.

The following are the results obtained by us:

	Calculated for $C_{20}H_{17}NO_5$.	Calculated for $C_{20}H_{19}NO_5$.	Found. I	II	III	IV	V
C....	68.344	67.953	——	67.64	68.06	——	——
H ...	4.880	5.423	5.521	5.64	5.65	5.587	5.61
N ...	3.995	3.972	....	....	....	....	4.17
O ...	22.781	22.652					
	100.000	100.000					

β-Homochelidonine—$C_{21}H_{21}NO_5$.

This alkaloid is second in abundance in the plant, and constitutes about one-third of the total alkaloids. It is described by Schmidt ‖ as colorless, needle-shaped crystals, frequently grouped into warts, and with a melting point of 159° C. It was first reported by Selle ¶, who isolated it from

* Ann. Chem. (Liebig) Suppl. *8*, 318: Ztschr. f. Chem. (2), 7, 653.

† Rec. Trav. Chim., *3*, 182.

‡ Arch. Pharm., *228*, 456.

§ Arch. Pharm., *231*, 170.

‖ Arch. Pharm., *231*, 169.

¶ Arch. Pharm., *228*, 443.

Chelidonium majus. It has also been found in Sanguinaria canadensis, while the bocconine of Battandier*, found in Bocconia frutescens, is probably identical with it. It is very soluble in chloroform, and is easily soluble in acetic ether. Its solubility in ether is about the same as that of protopine.

As prepared by us, it melted at 155° C. uncorrected, or 158.5° C. corrected. In all its physical properties it agrees with the alkaloid described as β-homochelidonine.

Combustions of the alkaloid gave the following figures:

	Calculated for $C_{21}H_{21}NO_5$.	Found. I	Found. II
C	68.625	68.40	68.10
H	5.766	5.84	6.12
N	3.823		
O	21.786		
	100.000		

Chelerythrine—$C_{21}H_{17}NO_4 + C_2H_5OH$.

Chelerythrine occurs in this plant in very small quantities. It is separated from the drug by the above-mentioned method, and is identified by its property of yielding lemon-yellow salts. It seems to possess various crystalline forms according to the solvent which is employed. From acetic ether it comes out as transparent crystals resembling β-homochelidonine with the exception that it is slightly pinkish. From a mixture of acetic ether and alcohol it frequently separates in the form of bunches or rosettes of prismatic crystals. It is exceedingly difficult to entirely remove the pinkish tint. The blue fluorescence which is noticed in its solutions becomes fainter and fainter as the alkaloid reaches a greater state of purity, so that we are inclined to the belief that the fluorescence is not due to the alkaloid as Koenig and Tietz† state, but rather to a decomposition product of the alkaloid. The melting point is given as 203° C. Chelerythrine is rather sparingly soluble in all solvents except chloroform, which dissolves it freely. It crystallizes with one molecule of alcohol.

Sanguinarine—$C_{20}H_{15}NO_4 + H_2O$.

In the work of Eijkman referred to above, the presence of sanguinarine in Macleya (Bocconia) cordata is reported, but as previously stated it exists in such small quantities as to elude all attempts to isolate it from the amount of material at hand. We get the blood-red salts, but have not been able to separate and identify the free alkaloid.

Since it is impossible to obtain this plant from botanic druggists, we shall grow a large quantity in the University gardens this coming summer

* Compt. rend., *120*, 1277.

† Archiv. Pharm., *231*, 145.

and continue the investigation next year, when we hope to learn something of the structure of these interesting alkaloids.

School of Pharmacy, University of Michigan.

The reading of the paper was followed by applause.

THE CHAIRMAN: As the Chair has already remarked, we have several papers in this group, which we will consider together and discuss afterwards. The next paper is upon the "Extraction and Estimation of Colchicine," by Messrs. Gordin and Prescott, and I will ask one of those gentlemen to present it.

Mr. Prescott read the paper as follows:

EXTRACTION AND ESTIMATION OF COLCHICINE.

BY H. M. GORDIN AND A. B. PRESCOTT.*

The estimation of colchicine in the root and seeds of *Colchicum autumnale* presents considerable difficulty. Owing to the easy decomposition of this alkaloid both by acids and alkalies, its extraction by alkaline immiscible solvents like Prollius' fluid is not advisable. Besides, it has lately been conclusively shown by C. Linde† that in the presence of water the immiscible solvents do not penetrate well into the drug, so that a much larger portion of the alkaloid is left in the drug than is taken up by the solvents. Another difficulty arises from the presence of considerable quantities of oil in this drug, particularly in the seeds. This oil when shaken with water forms an emulsion which obstinately refuses to separate into two layers. An attempt to remove the oil by percolation with petroleum ether previous to the extraction of the colchicine has shown that, though pure colchicine is insoluble in petroleum ether, it is nevertheless taken up by this solvent in the presence of the oil. This was proven by shaking out the petroleum ether extract of colchicum seed with water and then shaking out the filtered aqueous solution with chloroform. On evaporating the chloroform a yellowish residue was left, which gave all the reactions of colchicine.

It could be supposed that as colchicine is extracted from its aqueous solutions by chloroform even in the presence of free acid, the alkaloid could be extracted from the drug directly by chloroform without the use of alkali. Ten grammes of powdered (No. 60) colchicum seeds were therefore exhausted in a small percolator with cold chloroform till neither Mayer's nor Wagner's reagent gave any reaction with the acidulated solution of the residue left on evaporation of the chloroform from ten to fifteen drops of the percolate. The powder so exhausted was then thrown into an evaporating dish and thoroughly dried. The powder was then digested with frequent shaking with about 50 Cc. of modified Prollius' fluid,‡ the

* In the work of Research Committee D, Section 2, Committee of Revision and Publication of the Pharmacopœia of the United States.

† Arch d. Pharm. 1899, 172–185; 401–408.

‡ Lyons' Pharm. Assaying, 1899. Nelson, Baker & Co., Detroit, Mich.

mixture thrown on a filter and the filtrate evaporated to dryness. A yellowish residue was left which gave all the reactions of colchicine showing that cold chloroform does not take out all the colchicine from the seeds. Hot extraction with chloroform in a Soxhlet for four hours was then tried and the same negative results were obtained. As colchicine is very easily soluble in acetone and the latter is miscible with water, it was thought that this solvent might more easily penetrate into the drug and so extract all the colchicine from it. Extracting the powdered seeds with acetone and testing the exhausted powder in the way described above, it was found that neither cold nor even hot extraction for four hours with acetone could remove all the alkaloid from the powdered seeds. As the extraction in each case was continued till no more alkaloid could be detected in the percolate, the fact of the absence of alkaloid in the percolate is not conclusive proof of its complete removal from the drug. The only reliable test is to examine the exhausted drug as described above. The reason of the inability of chloroform or acetone to completely extract an alkaloid which is extremely soluble in these solvents, and which, moreover, does not form any salts, must be either that colchicine, or at least part of it, exists in the drug in some form which is insoluble in these solvents, or that neither acetone nor chloroform are able to penetrate well into the interior structure of the plant even when water is not present and the plant is in No. 60 powder.

After several experiments with other menstrua, it was found that cold alcohol (95 per cent.) leaves only a very small amount of alkaloid unextracted, and that hot extraction with alcohol for two hours removes the colchicine completely from the drug. The dried powder, after two hours' extraction with hot alcohol, was tested in the way described above, but no trace of alkaloid could be detected either by the aid of Mayer's, Wagner's or Scheibler's reagents. This method of extraction * should therefore be used for the assay of colchicum seed or root in preference to others.

If from the alcoholic extract of colchicum seed the alcohol be removed by distillation and the oily residue taken up with water, it will be found impossible to obtain a transparent solution by filtration, and on trying to shake the colchicine out from the oil with water, an emulsion is formed which even on long standing does not separate. The best way to obviate these difficulties is to pour the mixture of oil and water into a separator, add a few Cc. petroleum ether, and incline the separator in different directions without shaking. All the oil, together with the petroleum ether, rises quickly to the surface, and the aqueous liquid can be drawn off. As said above, this aqueous liquid cannot be made transparent by filtration; it is

* Alcohol was used for the gravimetric assay of colchicum by Kreml., Guareschi, Stud. d. Alk., 1896, 483.

therefore best to draw it off without filtering, into a graduated vessel, make it up to a definite volume, shake it up with a little purified talcum, and filter. In this way is obtained a perfectly transparent liquid, an aliquot portion of which can then be used for the estimation of colchicine. The way to separate the emulsion obtained on washing the petroleum ether and the oil, will be shown further in the description of the details of the assay.

As was pointed out in a previous article,* the general alkalimetric method of estimation of salt-forming alkaloids is not applicable to colchicine. The estimation of this alkaloid is best carried out either gravimetrically or by saponification with an excess of standard alkali and residual titration of the excess with standard acid, using phenolphtalein as indicator. The latter method is easy and quick, and is to be recommended in preference to the tedious gravimetric method. The saponification method of estimating colchicine is based upon the investigations of Zeisel,† which show that colchicine is a methyl ester of a monobasic acid *colchiceine*, which latter is *acetyl-trimethyl colchicic acid*. As was shown by Zeisel, boiling dilute aqueous alkali easily splits off the methyl group which is attached to the carboxyl with the formation of methyl-alcohol and an alkaline salt of colchiceine, without affecting either the acetyl or the other methyl groups of the molecule. These latter are only split off under the influence of more powerful reagents. The reaction is as follows: $C_{15}H_9(OCH_3)_3.(NH.COCH_3).(CO_2CH_3) + KOH = C_{14}H_9(OCH_3)_3.(NH.COCH_3).(CO_2K) + CH_3.OH$. One molecule of potassium hydrate, when used in dilute solution, is therefore equivalent to one molecule of colchicine, or one Cc. of normal fortieth ‡ potassium hydrate is equivalent to 0.01 Gm. colchicine.

In order to test the accuracy of estimation of colchicine by saponification, a sample of colchicine obtained from E. Merck & Co., and marked "amorph. pur." was digested for about half an hour on a boiling-water bath with hot water over the surface of which was drawn a good current of air by means of a suction pump. This treatment was found necessary and sufficient for the complete removal of chlorine compounds with which the alkaloid was found to be contaminated, and which undoubtedly came from insufficient removal of the chloroform used in its manufacture. The aqueous solution was then evaporated to dryness in a vacuum over sulphuric acid, and weighed out quantities of the pure colchicine so obtained, perfectly chlorine-free, were boiled § for two hours with 30 Cc. of fortieth

* Ber. d. chem. Ges., 1899, 2876; Pharm Arch., 1899.

† Monatshefte f. Chem. 9, 1.

‡ Zeisel used a third normal solution of alkali for the saponification of colchicine. A $\frac{N}{10}$ solution is more convenient for the estimation of small quantities of the alkaloid.

§ To prevent strong foaming, a very small piece of pure paraffin was thrown upon the surface of the liquid. This was not found necessary when working upon the colchicine extracted from the drug in the assay.

normal potassium hydrate in a flask fitted with a reversed condenser. The flask was then cooled, a few drops of phenolphthalein added, and the excess of alkali titrated back with fortieth normal hydrochloric acid in the usual way.

1. 0.1874 Gm. colchicine consumed 18.6 Cc. $\frac{N}{40}$ alkali = 0.186 Gm. colchicine.

2. 0.1382 Gm. colchicine consumed 13.5 Cc. $\frac{N}{40}$ alkali = 0.135 Gm. colchicine.

DIRECTIONS FOR THE ASSAY.

The details of the assay of colchicine seeds or root are as follows: Twenty-five Gm. of the powdered (No. 60) drug are exhausted in a Soxhlet or any other suitable hot extraction apparatus with strong alcohol (95 per cent.) for two hours, the alcohol is then distilled off completely, the oily residue taken up with about ten Cc. of hot water and the mixture without filtering poured into a small separating funnel. The vessel in which the extraction had taken place is washed two or three times with small quantities of hot water, and the washings added to the mixture in the separating funnel. Two or three Cc. of petroleum ether are now poured carefully into the separating funnel; the latter is inclined in different directions so as to allow this menstruum to take up the oily drops adhering to the sides of the separator. Shaking is likely to give an emulsion. The separator is set aside for fifteen to twenty minutes. After that time the oil will be found to be floating upon the surface of a turbid aqueous layer. The lower aqueous liquid is run off without filtering into a 100 Cc. measuring flask, washing the outlet tube once or twice with small quantities of water. About 10 Cc. water are now added to the contents of the separator, the latter vigorously shaken and its contents drawn off into a small evaporating dish. In a few minutes on a warm water-bath the small quantity of petroleum ether will have evaporated off, leaving a comparatively clear aqueous liquid having an oily layer on its surface. The contents of the evaporating dish are poured back into the separator, two or three Cc. petroleum ether again added, and after treating exactly as before, the aqueous liquid is drawn off into the measuring flask. The washing of the oil with water in this manner is repeated once more, and it will be found that no trace of colchicine will be left in the oil. To make the complete removal of colchicine sure, the oil should be washed once more, and a few drops of the filtered and strongly acidulated aqueous liquid tested with Mayer's or Wagner's reagent. If a reaction is obtained, the last washings should also be added to the contents of the measuring flask. The turbid liquid in the flask is now diluted to 100 Cc., one or two grammes purified talcum (National Formulary) added, the flask thoroughly shaken, and the liquid filtered through a dry filter.

Eighty Cc. of the perfectly clear filtrate (= 20 grammes drug) are measured off into a separator and shaken out three times with chloroform,

using about 30 Cc. of the latter each time. The chloroformic solutions are filtered through a very small dry filter into a flask and the chloroform completely distilled off. To the colchicine left in the flask, 10 Cc. of water are added, and while the flask is kept on a boiling water bath, air is drawn over the surface of the liquid by means of a pump for about half an hour. The colchicine can now be estimated either gravimetrically, or by saponification, or by both methods in succession, using one method as a control of the other. For the gravimetric estimation air is kept sweeping through the flask till all the water is driven off. The flask is then thoroughly dried in a vacuum over sulphuric acid and weighed. Taking the weight of the flask before or after the estimation, the amount of colchicine can be easily found. For the volumetric estimation, forty Cc., fortie h normal KOH are added to the solution of the colchicine after air had been drawn over it as described above, the flask connected with a reversed condenser and the liquid boiled briskly on a wire gauze for two hours. The flask is then cooled, the liquid diluted to about 100 Cc. and the excess of KOH titrated back with $\frac{N}{40}$ hydrochloric acid, using phenolphthalein as indicator. The number of Cc. of $\frac{N}{40}$ KOH consumed in the saponification, divided by twenty, gives the percentage of colchicine in the drug.

The volumetric estimation of colchicine as here described can be carried out in one day. It is also very inexpensive, as both the alcohol and the chloroform can be recovered.

Three assays of colchicum seed and as many of the root were made by the above method.

Colchicum Seed.

No. of Cc. $\frac{N}{40}$ KOH consumed by 20 Gm. of drug.	Per cent. of Colchicine. By saponification.	Gravimetric.
1 ..... 12.2	0.61	0.62
2 ..... 12.4	0.62	0.63
3 ..... 11.8	0.59	0.62

Colchicum Root.

1 ..... 8.2	0.41	0.43
2 ..... 8.4	0.42	0.43
3 ..... 8.2	0.41	0.42

It will be seen that no steps have been taken to effect a separation of the small quantity of colchiceine often present in the drug. There is no convenient method to effect this separation, and for pharmaceutical purposes this separation is hardly necessary. The results of assays given above were calculated as if all the alkaloid existed as colchicine.

In carrying out the titration as described above, it will be noticed that the end reaction is not very sharp. This is due to the yellowish color of the solution of the potassium salt formed. An attempt to remove this salt by "salting it out" by means of a saturated solution of sodium chloride has

shown that an addition of a large quantity of sodium chloride diminishes the amount of free potassium hydrate, so that the results obtained are too high. To prove this effect of large quantities of sodium chloride upon free potassium hydrate, we took definite quantities of our standardized potassium hydrate and titrated them both with and without the addition of sodium chloride, always using phenolphtalein as an indicator. In each case, on addition of salt, some potassium hydrate seemed to have disappeared.

$\frac{N}{40}$KOH taken, $\frac{N}{40}$ HCl required for neutralization.

	Without addition of salt.	With addition of NaCl.
21.3	21.3	22.2
34.2	34.2	35.2

The cause of this phenomenon might possibly be of the same nature as that which makes an acid "stronger" when we add a neutral salt to the acid. This has been found to be the case with the velocity of the inversion of sugar by acids.*

University of Michigan, January 12, 1900.

THE CHAIRMAN: The next paper is on "The Alkaloids of Ceanothus Americanus," by Mr. Gordin. It is not in print, and I will ask Mr. Gordin to read the original.

Mr. Gordin presented the paper as follows:

ON THE ALKALOIDS OF CEANOTHUS AMERICANUS.

BY H. M. GORDIN.

PRELIMINARY NOTICE.†

Ceanothus Americanus, or Red Root, is a small shrub growing in many parts of this country. The root is astringent, and the leaves of the plant were used as a substitute for tea during the Revolutionary war. The plant belongs to the natural order of Rhamnaceæ. The first investigation of the constituents of this plant was made by H. K. Bowman.‡ Later, H. M. Clinch ‖ published an investigation of the leaves. These were also investigated by J. A. Buckner. § The detection of an alkaloid in the root is due to Gerlach.¶ An alkaloid was also obtained but not analyzed from the Cenanothus reclinatus (L'heritier) by Stiern,** but owing to the statement of Stiern, that his alkaloid was precipitated by lead acetate, it is

*Arrhenius Zeit Phys. Chem. 31., 197-229.

† Though the work upon this subject is just in the beginning, it seems desirable to give the results obtained so far, as I intend to continue the investigation.

‡ A. J. Ph., 1869, 195.

‖ A. J. Ph., 1884.

§ A. J. Ph., 1891, 428.

¶ A. J. Ph., 1891, 332.

** Pharm. Rundschau., B. II, p. 122, 1884, N. Y.

doubtful whether the alkaloid of Ceonathus reclinatus is identical with the one obtained by Gerlach from Ceanothus Americanus.* This alkaloid was named by Gerlach ceanothine. He obtained it as a white granular powder by extracting the root of Ceanothus Americanus by means of acidulated water, and shaking out the aqueous extract, made alkaline, with a mixture of ether and chloroform. According to Gerlach, the root contains about half a per cent. of alkaloid. The root I was working upon † contains only 0.2 per cent of alkaloid. The root was assayed by several different methods, avoiding the use of strong agents and effecting as complete exhaustion as possible, but in no case could more than one-fifth of one per cent. be obtained.

The alkaloid obtained by Gerlach's method does not seem to be an individual compound, as by repeated solution in hot alcohol, the melting point of the alkaloid which separates out on cooling does not remain constant. The melting point of the crude alkaloid is not sharp; commencing to soften at about 170° C., it melts completely at 190° C. After the first separation from its solution in hot alcohol it melted at 227° C.; after a second separation the melting point ran up to 249° C. If the part which separates out on cooling from hot alcohol be dissolved in acidulated water, filtered, and precipitated by ammonia, a snow-white substance is obtained, which, after drying and washing, is almost insoluble in absolute ether, very difficultly soluble in alcohol, has a melting point of 255° C., and forms a picrate, which is very difficultly soluble in alcohol. If the same operations be p rformed upon the part which is left in the alcoholic mother liquor, *i. e.*, the latter be largely diluted with acidulated water, and filtered and precipitated with ammonia, a white substance is obtained, which is quite soluble in absolute ether, easily soluble in alcohol, melts at 200° C., and forms a picrate which is easily soluble in alcohol.

These facts would seem to indicate that the substance named by Gerlach ceanothine is a mixture of an ether soluble and an ether non-soluble compound, and I intend to try a purification or a separation by means of absolute ether and formation of derivatives. As to solution in hot alcohol and separation from the cooled solution, it is attended with too great loss of material to be of any value. All attempts to obtain the alkaloid or a derivative of it in a crystalline form have so far failed. The alkaloid forms a platinum salt, which is easily soluble in hot alcohol, but little soluble in cold alcohol. It also forms a gold salt, which is very easily soluble in cold alcohol, and its alcoholic solution is not precipitated by ether. The alkaloid forms an acetyl derivative and a benzoyl derivative. None of these compounds crystallize. It also absorbs bromine, which would seem

* Owing to the fact that ceanothine is "salted out" by many neutral salts, it is possible that this "salting out" was mistaken by Stiern for precipitation. If such be the case, Stiern's alkaloid might be identical with Gerlach's.

† Obtained from Allaire, Woodward & Co., Peoria, Ill.

to indicate that it is an unsaturated compound. A solution of the alkaloid in hot benzene or hot carbon tetrachloride gelatinizes on cooling. That the compound is an alkaloid was proven by Lassaigne's test for nitrogen and by its behavior towards immiscible solvents, but whether the compound is a mixture of several alkaloids or it is simply contaminated with some impurity will have to be investigated.

The alkaloid is easily extracted from the root by means of acidulated water or alcohol. It is almost insoluble in water, and its acetate is much less soluble than its hydrochloride or sulphate. It is easily "salted out" by neutral salts.

The details of the method of extraction which I used will be given in the near future, when I hope to obtain a better insight into the nature of this compound.

At the conclusion I take pleasure in expressing my heartiest thanks to Prof. Dr. A. B. Prescott, in whose laboratory this work is being carried out.

Ann Arbor, Mich., April 23, 1900.

The Chair announced that these papers were now open for discussion.

MR. PRESCOTT: I wish to say in explanation of this paper of Mr. Gordin being presented before completion of the subject, that it was done by my advice. If we could be assured that any one else was working upon it we should certainly wait until he was through. If there is any one else at work upon this subject we should be most grateful if he would publish his results, so that we can know what he is doing, and so that we will not duplicate his work. These investigations take so much time that reports should be made from time to time, so that no two men shall be doing the same work at the same time.

MR. LYONS: The papers are all very interesting. I wish to say one or two words only, because I have done very little work on these particular subjects.

The new method of alkalimetry as applied to alkaloids is a definite advance in alkaloidal assay. It occurred to me at once when the method was proposed that it would apply to the alkaloids of sanguinaria, because the color of their salts interferes with the use of ordinary indicators, and some experiments I have made show that very definite and satisfactory results can be obtained by the use of the new method, although the complex nature of the alkaloids of sanguinaria makes it impossible to report those results except as promising success.

Again, the method suggested for precipitation of alkaloids by Wagner's reagent is particularly applicable to a problem that has been a very difficult one, namely, for the assay frequently required of morphine in pills. It is not an easy matter to take a morphine pill and determine with any approximation of correctness how much morphine there is in it, and yet that is a problem that comes up continually, and the precipitation as periodide gives results that are easily obtained. Of course, it is possible to err; but, so far as I know, the results are fairly exact.

An invitation being extended by Mr. Prescott to ask any questions desired touching the details of extraction or the method of alkaloidal estimation employed by Mr. Gordin and himself in the experiments described and discussed in the papers presented by them, Messrs. Koch, Hynson,

Hallberg, Kebler, and others, made a number of inquiries, which Mr. Gordin very cheerfully, and at considerable length, answered, going more fully into the details of these experiments than could well be set out in the papers presented.

THE CHAIRMAN: Any method that shortens the process of an assay and fits it for use by the retail pharmacist is very desirable. The next paper is by Mr. Albert Schneider, and I will ask him to read it. This paper on Powdered Vegetable Drugs is not in print.

Mr. Schneider presented the paper as follows:

SUGGESTIONS ON THE INTRODUCTION OF POWDERED VEGETABLE DRUGS IN THE UNITED STATES PHARMACOPŒIA.

BY ALBERT SCHNEIDER.

INTRODUCTION.

This paper is intended to give a few timely suggestions regarding the introduction of powdered vegetable drugs into the United States Pharmacopœia. Only a few pharmacopœias of the world give any special attention or official recognition to simple vegetable powders, although such recognition is highly imperative.

The reasons why the powders of vegetable drugs should receive official recognition are self-evident and need scarcely be mentioned. It is certainly evident that medicinal substances so universally employed as the simple vegetable powders should receive attention equal to their importance; instead the majority of the pharmacopœias give them only a very casual and limited notice. Efforts should be made to determine the most efficient methods of powdering and sifting, and to recommend the adoption of uniform methods in the various mechanical operations involved in the preparation.

In order that the official recognition of vegetable powders may be effective, special attention must be given to histological characters; this necessitates more than ever the faithful and intelligent use of the compound microscope, by the student of pharmacy as well as by the practicing pharmacist.

The following is an outline of the conditions upon which the official recognition of powdered vegetable drugs should be based.

I.

POWDERS TO BE RECOGNIZED.

The powders of all important vegetable drugs which are employed in the powdered state. This would imply that some vegetable drugs which are at present unofficial are to be made official, as for example coto bark; while on the other hand it might be advisable to exclude certain drugs because they are not sufficiently important.

II.

SELECTION OF DRUGS FOR POWDERING.

Great care should be observed in selecting drugs for powdering. Such drugs should be of good quality, well garbled and free from dirt, dust, sand, lime and other impurities and other undesirable particles, inclusive of the various adulterants. A poor quality of drug, when powdered, is difficult to distinguish from a good quality, and it is practically impossible to remove impurities from the powder, hence the necessity of giving careful attention to these matters before powdering. Adulterations, fraudulent and otherwise, will be explained more fully elsewhere.

III.

PREPARATION OF VEGETABLE DRUGS FOR POWDERING.

1. *Drying.*—Some definite and uniform system of drying preparatory to powdering should be adopted for each drug or group of drugs, giving special attention to the most suitable means of drying and the best temperature to be employed. It should be accurately determined what proportion of active constituents are chemically destroyed or volatilized in the process of drying.

2. *Atmospheric Moisture and Temperature.*—Since the tenaciousness of vegetable tissues is greatly modified by temperature and moisture, attention must be given to these factors, in order that the powder may be of uniform fineness. The powders of the same drug prepared and dried in the same way, but powdered in an atmosphere varying in moisture and temperature, will vary proportionately in fineness and uniformity. Vegetable substances are more readily powdered in an extremely cold dry atmosphere: it would therefore be advisable to consider the feasibility of powdering drugs during cold weather or at an artificially reduced temperature; this would avoid the necessity of excessive drying, and would prevent the loss of active constituents resulting therefrom.

IV.

POWDERING AND SIFTING.

1. *Apparatus for Powdering.*—Some mill or other apparatus producing a powder or powders of the uniform fineness desired or required should be used. All mills or other apparatus adopted for use should be capable of the same operative effectiveness, irrespective of size and working capacity.

2. *Sifting.*—Sieves having uniform square meshes should be used. The dimensions of the meshes should be given in the metric system, and should indicate the diameter of the open space, irrespective of the diameter or thickness of the wire, silk, hair or other substance employed in making sieves. The operative effectiveness of large and small sieves should be compared, and a uniform method of sifting and cleaning sieves should be adopted.

Sifting by hand and sifting by machinery should be carefully compared in order to determine the relative uniformity of the powders resulting therefrom.

V.

SPECIAL SUPERVISION OF POWDERING DRUGS.

Since it is quite generally admitted that the powdering and sifting of vegetable drugs can be more efficiently done on a large scale, by means of large, complicated and expensive machinery, it might be advisable to establish powdering stations, where the powdering is conducted under government or other official supervision, the prime object of such supervision being to secure purity and uniformity of powders.

VI.

HOMOGENEITY OF POWDERS.

1. *Uniform Powdering.*—Special attention should be called to the importance of reducing all parts of the vegetable substance to the same degree of fineness and not to reject any portion in the sifting, in order that the strength of the medicinal product derived therefrom may be uniform. In some instances it may be practicable to discard the more fibrous inert portions of the drug, but this can only be done successfully if the active constituents are largely limited to a definite part of the drug, and when this part separates very readily from the inert portion.

2. *Mixing of Powders.*—Careful instruction should be given as to the mixing of powders after powdering and sifting, and also each time a portion of the powder is to be used. This is to guard against variation in the medicinal strength of the powder or percolate. In powdering the more friable tissues (parenchyma), containing most of the active constituents, are much more readily comminuted than the tougher, more fibrous and largely inert portions; hence the necessity of thoroughly mixing after powdering. In shipping, handling and even in storing, the heavier particles are more or less separated from the lighter particles which would cause a variation in the strength of the powder, hence the necessity of mixing the powder each time a portion is intended for use.

VII.

FINENESS OF POWDERS.

Specific instructions should be given as to the most suitable degree of fineness of each powder or group of powders, the fineness to be given in the number of meshes to the centimeter.

Fineness of powders should be carefully considered as to the histological characteristics of the vegetable substance; the chemical composition of the active ingredients and the intended method or methods of extraction. The theoretical fineness and the practicably efficient fineness should

be carefully considered and compared. Theoretically the vegetable cells should be separated and each cell should be broken so that the menstruum (alcohol especially) may act upon the inner and outer layers of the cell-walls at the same time. In other words, the finer the powder the more complete and rapid the exhaustion, provided it were possible to keep the particles of the powder sufficiently separated to overcome capillarity. Percolation and extraction under pressure should also be considered.

VIII.

DETERIORATION OF VEGETABLE POWDERS.

1. *Fresh Powders.*—It is well known that powdered vegetable drugs deteriorate much more rapidly than crude drugs. It should therefore be urged not to powder drugs until ready for use, and not to powder more than can be used within a reasonable length of time. The date of powdering should be stamped on the container, also the age of the drug from which the powder was made.

2. *Preservation of Powders.*—A uniform and efficient method of packing, shipping and storing powdered drugs should be adopted. Since the deterioration of the powders is due principally to atmospheric moisture, some method should be adopted to exclude or remove such moisture from the containers or storerooms.

3. *Renewal of Powders.*—Upon each package of the powdered drug should be a statement as to when the powder should be discarded, due to loss of active constituents. Even under the most careful precautions, powders deteriorate continually, some drugs more rapidly than others; the pharmacist should therefore know not only the origin of the powder as to time and place, but should also know when the destructive changes of active constituents have progressed so far as to reduce the medicinal strength materially. Specific instructions should be given as to when the powder should be classed as worthless, and how to compensate partial loss of active constituents.

IX.

OFFICIAL DESCRIPTIONS OF POWDERS.

The official description of each powdered vegetable drug should be given in as few words as possible, consistent with clearness, and should be based upon the following characteristics.

1. *Gross Characters.*—Giving the fineness, consistency, weight per volume, color, odor and taste of each powder. Attention should be called to the fact that color is greatly modified by fineness, age, exposure to light and attacking fungi; and that the odor and taste are usually less pronounced than in the crude drugs. Weight per volume may be of great assistance in determining the quality of the powder.

2. *Histological Characters*—The histological elements as they appear in the pure powdered drug should be carefully and fully described.

3. *Color Reactions.*—Certain vegetable drugs give diagnostic color reactions with certain chemicals. Such reactions should be given in the official descriptions.

X.

DETERMINATION OF THE PURITY OF VEGETABLE POWDERS.

1. *Poor Quality.*—Unscrupulous dealers are likely to use inferior grades of crude vegetable drugs for powdering. It is therefore highly important that the pharmacist should have the ability to recognize a good quality of the powdered drug. Such recognition must be based largely upon the description of gross characters since the histological elements of a poor quality of drug are essentially the same as that of a good quality.

2. *Sophistication of Powders.* — The determination of the absence or presence of foreign substances (adulterants) will depend almost wholly upon a microscopical examination. Special attention must be given to diagnostic cell-forms, cell-contents, micrometer measurements and micro-chemical relations. A list of the more common sophisticants should be appended to the official description of each powder together with a mention of diagnostic or important histological characters.

Chicago, Ill., April, 1900.

MR. HALLBERG: I move that this paper of Mr. Schneider take the same course as the one he presented and read to this Association last year.

MR. CHAIRMAN: Is there a second to the motion?

MR. SAYRE: Before I second it, I want to know what the motion of Mr. Hallberg means.

MR. HALLBERG: There is a note in last year's Proceedings to the effect that Mr. Schneider presented a paper, but took it away with him, and that the General Secretary was unable to get it back from him for publication in the Report, and Mr. Schneider's excuse was, that he did not intend to have it published — that he wanted it for another purpose. If this Association is to be used for the purpose of presenting papers not the property of the Association, and which are denied to the Association for publication, I shall oppose such a course. That is why I moved that this paper take the same course as the one presented last year.

THE CHAIRMAN: If the motion is not seconded, it cannot be entertained.

MR. STEWART: I second the motion.

MR. SCHNEIDER: I only want to say that if the Association had seen fit to publish the paper that was offered I should have been glad to have it do so; but, as stated in the letter to the Secretary, the paper would make a book of some four hundred pages, including one hundred and seventy-five full page illustrations, and I did not see how the Association could afford to embody it in the Proceedings; that was all.

MR. HALLBERG: I would like the Secretary to read his statement. That statement, I think, is substantially what I have said here.

MR. CASPARI: I know it was published in the Proceedings. When, in making up the Proceedings, I came to the reference to the two papers presented by Mr. Schneider, I could not find them among the papers handed me by the Secretary of the Section. I wrote to the author, and was informed that the papers were part of a book that was to be published—that the subject was presented in part only, and that the papers formed part of the proposed publication and could not be published in the Proceedings. I then put a note to that effect in the Proceedings at the proper point. The two papers were presented at the Put-in Bay meeting and were accepted by the Association, and thereby became the property of the Association. As General Secretary I, of course, claimed the right to these papers, but when I asked for them I was told that they were not intended for publication in the Proceedings, and they were not turned over to me. These are the facts in the case. The Secretary's statement and Mr. Schneider's letter to him may be found at the bottom of page 221 of last year's volume of Proceedings.

MR. PRESCOTT: We have a Committee to stand guard over the reception of papers, and a Publication Committee to stand guard over the printing of papers. I think we can trust them to do their duty. I move to lay the subject on the table, and refer the matter to them.

And it was so ordered.

THE CHAIRMAN: Is there any discussion on the paper of Mr. Schneider? If not, the paper will be ordered to take the usual course.

MR. SAYRE: I move that the other papers along the same line be read before the discussion of this paper.

THE CHAIRMAN: I have a paper here by Mr. Kraemer, but I hardly think the Association will care to have the paper read because it is very largely in the form of a tabulated statement. The title of the paper is "Color Standards of the Vegetable Drugs of the United States Pharmacopœia." It is a paper of considerable length, and no abstract accompanies the same.

On motion, the paper was read by title and referred to the Committee on Publication.

COLOR STANDARDS OF THE VEGETABLE DRUGS OF THE U. S. P.

BY HENRY KRAEMER AND HERBERT J. WATSON.

This paper is a continuation of the one upon "Color Standards of Powdered Vegetable Drugs," presented by one of us a year ago to this Association. The present communication includes a grouping of the crude drugs according to the *Color Standards* given in the first paper, and a list of the colors of the pharmacopœial drugs in a crude and powdered condition. The figures 1, 2, 3, etc., in the tables indicate the proportions of the respective colors in a decreasing ratio, *i. e.*, Allium (external) has Chinese white (1) in excess of Sepia (2); Cardamom Seed (internal) has Chinese white (1) in excess of Gamboge and Cobalt blue, which are in equal proportions.

PART I.

In the accompanying lists the crude drugs are arranged according to

the color standards to which they belong, *i. e.*, according to the colors of the external and internal parts.

I. White Group.

	Chinese white.	Sepia.	Yellow ochre.	Gamboge.	Cobalt blue.	Raw umber.	Sap green.	Vandyke brown.	Lemon yellow.	Crimson lake.	Sepia.	Brown madder.	Burnt sienna.	Cadmium yellow.	Hooker's No. 2 Green.
Allium (external)	1	2													
Amygdala Dulcis (internal)	1	..	2												
Anthemis (ligulate corolla)	1	..	2	3											
Cardamomum (seeds, internal)	1	..	..	2	2										
Meninspermum (internal)	1	..	..	..	..	2									
Pepo (external)	1	..	2												
Pepo (internal)	1	..	2	..	..	..	3								
Physostigma (internal)	1	..	2												
Amygdala Amara (internal)	1	.	2												
Matricaria (ligulate corrolla)	1	..	2		3										
Gossypium	1	..	..	..	2										

II. *Light Yellow Ochre Group.*

	Chinese white.	Sepia.	Yellow ochre.	Gamboge.	Cobalt blue.	Raw umber.	Sap green.	Vandyke brown.	Lemon yellow.	Crimson lake.	Sepia.	Brown madder.	Burnt sienna.	Cadmium yellow.	Hooker's Green.
Aconitum (internal)	1	..	..	..	..	..	..	2							
Absinthium (stems)	1	..	2												
Anthemis (stamens)	1	..	2	..	..	..	..	..	3						
Anisum (stems)															
Aurantii Dulcis Cortex (internal)	1	..	2												
Asafœtida	1	..	2	..	..	..	..	..	3	4					
Asclepias (internal)	1	..	2	..	..	..	..	..	..	..	3				
Aspidosperma (wood)	1	..	2												
Cardamomum (capsules, external)	3	..	..	..	..	..	..	..	..	..	..	1	2		
Cassia Fistula (seed, internal)	2	..	1												
Belladonnæ Radix (internal)	1	..	..	2	..	..	..	2							
Bryonia (internal)	1	..	..	..	..	..	..	..	..	..	..	..	2	2	
Limonis Cortex (internal)	1	..	2												
Pyrethrum (internal)	3	..	..	..	..	..	..	1	..	..	..	2			
Quassia	1	..	..	..	..	2	3								
Sumbul (internal)	1	..	..	..	..	..	..	3	..	..	..	..	2		
Sarsaparilla (internal)	1	..	2	..	..	..	..	..	..	..	..	..	3		
Triticum	1	..	2	3	..	..	..	..	..	..	..	..	..	..	3
Veratrum Viride (internal)	1	..	1	3											
Zingiber	1	..	2	..	..	..	..	..	..	..	..	..	3		
Anisum (internal)	1	..	2												
Chirata (internal)	1	..	2	..	..	..	3								
Conium (internal)	1	..	2	..	..	..	2								
Sinapis Alba (internal)	1	..	..	1											
Sinapis Nigra (internal)	1	..	..	1											
Serpentaria (internal)	1	..	2	..	..	..	2	3							

III. *Dark Yellow Ochre Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Gamboge.	Vandyke brown.	Burnt sienna.	Raw sienna.	Raw umber.	Emerald green.	Sap green.	Hooker's No. 2.	Cobalt blue.
Aurantii Amari Cortex (internal)	1	2	..									
Caulophyllum (rhizome, internal)	1	2	..	3								
Cinchona (external)	1	3	..	..	2	2	..	..	4			
Cetraria	1	..	..	..	2	..	..	2				
Ergota (internal)	1	2	..	..	2							
Gentiana (internal)	1	2	..	..	..	..	2					
Nux Vomica (external)	1	..	..	..	1	..	..	..	..	1		
Zea	1	1	..	..	..	..	.	2				

IV. *Lemon Yellow Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Gamboge.	Vandyke brown.	Burnt sienna.	Raw sienna.	Raw umber.	Emerald Green.	Sap Green.	Hooker's No. 2.	Cobalt blue.
Allium (internal)	1	..	2	..	..	..	..	..	..	..	3	
Anthemis (tubular corolla)	1	2										
Apocynum (wood)	1	2	2									
Aspidium (internal)	1	2	..	..	..	..	..	..	..	..	3	
Glycyrrhiza (internal)	1	..	2	3								
Grindelia (stem)	1	2	3									
Mastiche	..	..	1	..	..	..	..	..	..	..	2	
Podophyllum (internal)	1	2	..	3								
Taraxacum (internal)	1	..	..	2								
Tragacantha	1	..	..	2								
Senega (internal)	1	2	..	..	..	..	..	..	..	..	..	2
Scilla	1	..	2	..	..	3						

V. *Luminous Yellow Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Gamboge.	Vandyke brown.	Burnt sienna.	Raw umber.	Emerald green.	Sap green.	Hooker's No. 2.	Crimson lake.	Cadmium yellow.	Hooker's No. 1.	Raw sienna.	Brown madder.	Rose madder.
Acacia	..	..	1	..	..	..	..	..	..	3	2					
Arnicæ Flores	2	1	..	..	..	..	..	..	..	..	..	2				
Calendula	1	..	..	..	3	..	..	..	..	..	..	2				
Calumba (internal)	..	2	1	..	3	..	..	..	..	.	..	2	3			
Colocynthis (pulp)	1	2	..	3												
Hydrastis (internal)	..	..	..	1	3	..	..	..	..	..	..	..	2			
Inula (internal)	1	..	2	2	..	..	3									
Manna	1	2	..	..	..	..	..	..	..	3	..	2	..	2		
Pix Burgundica	..	..	2	..	..	1										
Quassia	1	..	2	2	..	..	..	..	..	..	..	..	3			
Linium (internal)	1	..	..	1	..	..	..	..	2							
Ficus (seeds, external)	1	..	..	1	..	..	..	..	..	..	..	2				
Glycyrrhiza (internal)	1	..	2	3												

V.—*Luminous Yellow Group—Continued.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Gamboge.	Vandyke brown.	Burnt sienna.	Raw umber.	Emerald green.	Sap Green.	Hooker's No. 2.	Crimson lake.	Cadmium yellow.	Hooker's No. 1.	Raw sienna.	Brown madder.	Rose madder.
Resina (dark)	..	..	1	..	..	2	..	..	3	..	3					
Resina (light)	..	..	1	..	..	2	..	..	..	..	..	2				
Sambucus	1	1	2	..	..	..	..	..	3	..	..	..	..	2		
Terebinthina (dark)	..	..	2	..	..	1	..	..	..	..	..	2				
Terebinthina (light)	1	..	1	..	..	..	..	..	..	..	..	..	..	2		
Zingiber (external)	1	..	..	2	..	..	..	..	..	..	..	..	3			
Matricaria (tubular florets)	..	..	..	1	..	..	2	..	2							

VI. *Pink Group.*

No representatives of this group in the crude drugs.

VII. *Rose Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Gamboge.	Vandyke brown.	Burnt sienna.	Raw umber.	Emerald green.	Sap green.	Hooker's No. 2.	Crimson lake.	Cadmium yellow.	Hooker's No. 1.	Raw sienna.	Brown madder.	Rose madder.
Allium (outer scales)	2	..	..	..	..	..	2	..	..	..	..	..	..	..	1	
Coriandrum	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	
Grindelia (stem)	1	2	..	..	..	..	..	..	..	..	..	..	..	..	1	
Mentha Piperita (leaves and stems)	2	..	..	..	..	..	..	..	3	..	..	..	..	..	1	
Mentha Viridis (stems)	2	..	..	..	..	..	..	..	3	..	..	..	..	..	1	
Melissa (stems)	1	..	..	..	..	..	3	..	..	..	..	..	..	..	2	
Senega (external)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Rosa Gallica (petals)	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	1
Pulsatilla (stem)	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	

VIII. *Yellowish-Red Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Crimson lake.	Rose madder.	Cadmium yellow.	Gamboge.	Burnt sienna.	Raw sienna.	Vermilion.	Raw umber.	Brown madder.	Light red.	Vandyke brown.	Sap green.
Cambogia	..	..	..	1	..	..	1								
Capsicum (pericarp, internal)	1	1	..	..	..	..	2								
Capsicum (pericarp, external)	..	..	..	..	..	1	..	..	..	1					
Crocus (stigmas)	..	..	..	1	..	2	..	..	..	3					
Crocus (style)	1	1	..	..	..	2	..	2							
Frangula (internal)	..	..	..	..	..	..	..	1	1	..	2				
Hæmatoxylon	..	..	..	..	..	..	..	2	..	..	..	1	2		
Limonis cortex (internal)	2	1	..	..	..	1									
Macis	..	1	..	..	2	..	..	..	2						
Sanguinaria (internal)	..	..	..	1	..	1	..	..	..	..	2				
Viburnum Prunifolium (internal)	1	..	..	..	..	..	..	2	2						

IX. *Red Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Crimson lake.	Rose madder.	Cadmium Yellow.	Gamboge.	Burnt sienna.	Raw sienna.	Vermilion.	Raw umber.	Brown madder.	Light red.	Vandyke brown.	Sap green.
Aspidosperma (inner bark)	..	..	..	..	..	..	..	2	..	..	..	..	1		
Cinchona (internal)	..	2	..	..	..	..	..	1	..	..	1				
Cinchona Rubra (internal)	..	..	..	..	..	..	..	..	..	..	..	..	1	2	
Hæmatoxylon	..	..	..	..	..	..	..	1	..	..	..	1	2		
Krameria (internal)	..	..	..	2	..	..	..	..	..	..	..	1	..	2	
Rhus Glabra (external)	..	..	..	1	..	..	..	..	..	..	2				
Santalum Rubrum	..	..	..	..	..	..	..	2	..	..	..	..	1		
Viburnum Opulus (internal)	..	..	..	..	..	..	..	..	..	..	..	1	..	1	

X. *Brown Madder Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Gamboge.	Vandyke brown.	Brown madder.	Burnt sienna.	Raw sienna.	Raw umber.	Sap green.	Light red.	Crimson lake.
Cassia Fistula (external pericarp)	..	..	..	..	1	1						
Cubeba (internal)	..	..	..	..	2	1						
Benzoinum	2	2	..	..	1	1	1					
Illicium (fruit or pericarp)	..	..	..	..	..	..	..	1	1	..	1	
Krameria (Savanilla, external)	..	..	..	..	2	1	..	..	..	..	..	2
Krameria (Peruvian, external)	..	..	..	..	1	1						
Leptandra (roots)	..	..	..	..	..	1	..	..	1			
Opium	..	..	..	..	1	..	..	2				
Pimenta (seed)	..	..	..	..	..	1	2					
Physostigma (external)	..	..	..	..	..	1						
Prunum (internal)	..	..	2	..	..	..	1	1				
Rhamnus Purshiana (external)	..	..	..	..	2	1						
Scoparius (stem, external)	..	..	..	..	..	1						
Sinapis Nigra (external)	..	..	..	..	..	1	..	..	2			
Viburnum Prunifolium (external)	..	..	..	..	2	1						

XI. *Yellowish Brown Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Crimson lake.	Rose madder.	Cadmium yellow.	Gamboge.	Burnt sienna.	Raw sienna.	Vermilion.	Raw umber.	Brown madder.	Light red.	Vandyke brown.	Sap green.
Ammoniacum	..	1	..	..	..	..	..	..	..	..	..	..	..	2	
Arnicæ Radix (internal)	1	2	2	..	..	..	..	..	..	..	3	..	..		
Bryonia (external)	1	..	..	..	..	2	..	2	..	..					
Chelidonium (stems)	..	..	..	..	..	..	..	..	..	..	1	2	..	3	2
Granatum (external)	1	1	..	..	..	..	..	2							
Scilla	1	..	..	..	..	..	..	..	2	..	..	..	..	..	
Sinapis Alba (external)	1	..	..	..	..	..	..	..	..	2	..	..	..	..	
Staphisagria (internal)	1	..	..	..	..	..	..	..	..	2	..	..	..	..	2
Veratrum Viride	..	1	..	..	..	..	..	..	..	..	..	..	..	2	

XII. *Raw Sienna and Umber Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Raw sienna.	Raw umber.	Burnt sienna.	Vandyke brown.	Sap green.	Cadmium yellow.	Gamboge.	Sepia.	Light red.	Brown madder.	Rose madder.	Hooker's No. 2.	Hooker's No. 1.
Absinthium (flowers)	1	..	..	2	..	..	..	..	..	3						
Aloe Barbadensis	..	..	..	1	1											
Althæa	1	2	..	..	..	..	..	..	..	3						
Amygdala Amara (testa)	..	..	..	1												
Amygdala Dulcis (testa)	..	..	..	1												
Apocynum (bark)	..	..	..	1	..	..	1									
Arnicæ Radix (external)	..	..	..	..	2	..	1									
Asclepias (external)	1	2	..	..	..	2										
Aspidosperma (external)	..	2	..	..	..	..	..	..	..	..	1	1				
Aurantii Amari Cortex (external)	2	..	..	..	..	1	1									
Aurantii Dulcis Cortex (external)	2	..	..	..	..	1	1									
Belladonnæ Radix (external)	2	..	..	..	1	..	2									
Calamus (external)	2	2	..	..	..	1	1									
Calamus (internal)	1	2														
Capsicum (calyx)	..	..	..	1	1											
Capsicum (seeds)	1	1	..	..	..	2										
Cascarilla (internal)	1	..	..	..	..	..	2									
Cardamomum (seeds, external)	3	..	..	.	..	2							1			
Caryophyllus (dark)	..	..	..	..	2	..	1									
Caryophyllus (light)	..	..	..	..	..	1										
Cascarilla (external)	1	..	..	..	..	..	2	..	..	..	3					
Cassia Fistula (seeds, external)	..	..	..	..	1	2										
Cetraria	..	..	..	..	1	..	1									
Chondrus	1	..	..	1												
Cinchona Rubra (internal)	1	..	..	..	1											
Cinnamomum Cassia (internal and external)	3	..	..	..	1	2										
Cinnamomum Cassia (external)	2	..	..	..	1											
Cinnamomum Saigonicum	3	..	..	..	..	..	1	..	4	..	..	2				
Cinnamomum Zeylanicum	1	..	..	..	1	2										
Colchici Semen (internal)	1	..	..	..	2											
Convallaria	1	..	3	2	2											
Coriandrum	1	..	..	2	2											
Cusso	1	..	..	..	1	2										
Cypripedium	..	..	..	1	1											
Digitalis (petioles)	1	2	..	..	..	..	2									
Euonymus (internal)	1	..	..	..	2											
Glycyrrhiza (external)	1	..	..	..	2	..	2									
Gelsemium (external)	1	2	..	..	3	..	..	..	3							
Gelsemium (internal)	1	1	..	..	..	..	..	..	2							
Gentiana (external)	2	..	..	..	1	..	..	..	..	..	..	..	1			
Geranium (internal)	1	3	..	..	..	..	..	..	..	..	..	..	2			
Ficus (pulp)	..	..	..	..	1	..	..	..	..	2						
Gossypii Radicis Cortex (external)	2	..	..	1	..	..	1									
Gossypii Radicis Cortex (internal)	1	..	..	2	1											
Guarana	3	..	..	2	..	..	1									
Humulus	2	..	..	..	..	1										
Illicium (seed)	2	..	..	2	1											
Ipecacuanha (internal)	1	2														
Iris (internal)	1	..	..	..	..	2	..	..	..	..	..	..	2			
Lappa (internal)	1	..	..	..	..	..	2									
Leptandra (rhizome, external)	1	..	..	2	1	..	..	..	..	3						
Linum (external)	..	..	..	1	1											
Lobelia	..	3	..	..	..	..	..	2	..	..	..	..	..	..	1	
Myristica	3	..	..	2	1	..	..	..	..	..	..	..	..	4		

XII. *Raw Sienna and Umber Group—Continued.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Raw sienna.	Raw umber.	Burnt sienna.	Vandyke brown.	Sap green.	Cadmium yellow.	Gamboge.	Sepia.	Light red.	Brown madder.	Rose madder.	Hooker's No. 2.	Hooker's No. 1.
Myrrha	2	..	..	1	..	1										
Phytolaccæ Radix (internal)	1	..	..	..	..	2										
Prunum (external)	..	..	..	..	..	..	..	..	..	..	2	..	1			
Prunus Virginiana	..	..	..	..	1	1										
Quercus Alba	3	..	..	..	2	..	..	..	..	..	..	..	1			
Quillaja (light)	1	..	..	..	..	..	..	..	..	2	..	..	2			
Quillaja (dark)	2	..	..	1	2											
Rhamnus Purshiana (internal)	1	..	..	..	..	2										
Rheum	2	..	3	..	..	1										
Rosa Centifolia	1	..	..	..	2	1										
Rosa Gallica	1	..	..	..	2	1										
Rubus (external)	2	..	..	..	..	1	2									
Rumex (internal)	1	..	3	..	2	2										
Santonica	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Sassafras	..	..	..	..	1	1										
Senega (external)	1	2	..	..	1	..	2									
Stillingia (internal)	1	..	..	..	..	2										
Stramonii Semen (external)	..	..	..	..	..	..	1									
Strophanthus (brown seeds, external)	1	..	..	..	..	1										
Sumbul (external)	..	..	..	..	1											
Tabacum (dark)	..	..	..	..	1	..	..	..	..	..	..	..	1			
Tabacum (light)	..	..	..	..	1											
Taraxacum (internal)	1	..	..	..	..	2										
Taraxacum (external)	..	..	..	..	..	..	1	..	..	..	..	..	1			
Ulmus	1	..	..	..	2	2										
Uva Ursi (brown leaves)	..	..	..	1	..	1	2									
Valeriana (external)	1	..	..	..	1											
Viburnum Opulus (internal)	2	..	..	..	..	..	1	..	..	..	..	..	1			
Xanthoxylum (internal)	1	2	..	2												
Xanthoxylum (external)	1	..	..	2	2											

XIII. *Vandyke Brown Group.*

	Chinese white.	Yellow ochre.	Lemon Yellow.	Gamboge.	Vandyke brown.	Brown madder.	Burnt sienna.	Raw sienna.	Raw umber.	Sap green.	Sepia.	Cadmium yellow.	Hooker's No. 1.	Light red.
Aconitum (external)	..	..	..	..	1									
Aloe Socotrina	..	..	..	..	1									
Asafœtida	..	1	..	..	1									
Aspidium (external)	..	..	..	..	..	..	..	1	1					
Belladonnæ Folia	..	2	..	..	1									
Carum	2	..	..	..	1	2								
Caulophyllum (rhizome, external)	1	..	..	..	..	..	..	..	1					
Caulophyllum (roots)	1	..	..	..	..	..	..	..	1					
Chelidonium (stems and leaves)	..	..	..	..	1	..	..	..	2					
Chirata	3	..	..	..	1	..	..	2						

XIII. *Vandyke Brown Group—Continued.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Gamboge.	Vandyke brown.	Brown madder.	Burnt sienna.	Raw sienna.	Raw umber.	Sap green.	Sepia.	Cadmium yellow.	Hooker's No. 1.	Light red.
Cinchona Rubra (external)	2	..	..	..	1	..	..	..	2					
Cimicifuga (internal)	1	..	..	..	2									
Cimicifuga (external)	1	..	..	..	1									
Colchici Radix (external)	3	..	..	..	1	..	..	..	2					
Colchici Radix (internal)	1	2	..	..	..	..	..	..	..	..	3			
Colchici Semen (external)	3	..	..	..	1	2								
Convallaria	3	..	..	.	1	..	..	2						
Cubeba (external)	3	..	..	..	1	..	..	2						
Cypripedium	..	..	..	..	1									
Euonymus (external)	1	..	..	..	2									
Frangula (external)	2	..	..	.	1	3								
Galla (internal)	1	2	..	..	3	..	..	..	..	..	..	3		
Geranium (external)	2	..	..	..	..	1	..	..	1					
Glycyrrhiza (external	1	..	..	..	2	..	..	..	2					
Granatum (external)	2	..	..	..	1	..	..	..	..	1				
Hedeoma (stems)	..	..	..	..	1	..	..	..	..	2				
Hydrastis (external)	2	..	..	3	1	..	..	..	..	..	..	..	3	
Hyoscyamus (leaves)	2	..	..	..	1	..	..	..	1	..	..	..	2	
Inula (external)	..	..	..	..	1	..	..	2	..	..	..	..	..	3
Ipecacuanha (external)	2	..	..	..	1									
Iris (external)	2	..	..	..	1	..	1							
Jalapa (internal)	1	..	..	..	1	..	..	..	2					
Jalapa (external)	2	..	..	..	1	..	..	..	3					
Lactucarium	1	..	..	..	3	..	2							
Lactucarium	3	..	..	..	1	..	2							
Lappa (external)	2	..	..	..	1	..	3							
Menispermum (external)	2	..	..	..	..	..	..	..	1					
Mezereum (external and internal)	1	..	..	..	3	..	2							
Pareira (internal)	..	..	..	..	1	..	..	2						
Phytolaccæ Fructus	..	..	..	..	..	1	..	..	2					
Phytolaccæ Radix (external)	3	..	..	..	1	.	2							
Pimenta (pericarp, external)	3	..	..	..	..	2	1							
Piper (internal)	1	2	..	..	3									
Podophyllum (external)	..	..	..	..	1	2	3							
Pyrethrum (external)	1	..	..	2	2									
Quercus Alba (light portion)	1	..	..	..	2	..	..	..	2					
Rhamnus Purshiana (external)	2	..	..	..	1	2	..	..	..	3				
Rhus Glabra (internal)	1	..	..	..	2	..	..	3						
Rumex (internal)	3	..	..	..	1	2								
Sanguinaria (external)	..	..	..	..	1	..	..	..	1					
Sarsaparilla (external)	..	1	..	..	2	..	2							
Sassafras (external)	..	..	..	..	1									
Serpentaria (dark, external)	..	..	..	..	1									
Serpentaria (light, external)	..	..	..	..	..	..	..	..	1					
Spigelia	..	..	..	..	1	2								
Staphisagria (external)	..	..	..	..	1	..	..	..	2					
Stillingia (external)	..	..	..	..	1	..	2							
Sumbul (dark, external)	..	..	..	..	1									
Tanacetum (stems and leaves)	..	..	..	..	2	..	..	..	1					
Triticum (dark)	..	..	..	..	1	..	..	..	1					
Vanilla (external)	..	..	..	..	1	1								
Veratrum Viride (dark)	..	..	..	..	1									
Viburnum Prunifolium (external)	1	..	..	..	1									
Zea	..	..	..	..	1	..	..	..	1					

XIV. *Sepia Group.*

	Chinese white.	Brown madder.	Sepia.	Vandyke brown.	Hooker's No. 1.	Hooker's No. 2.	Raw umber.	Black.	Sap green.
Cassia Fistula (pulp)	....	....	....	1					
Catechu	...	2	....	1	.				
Chenopodium	....	2	1						
Ergota (external)	....	....	....	1					
Galla (external)	3	....	....	....	2	2	1		
Juglans	....	....	....	1	....	....	1		
Kino	....	1	1						
Leptandra (roots)	....	2	1						
Pareira (external)	....	....	....	1					
Piper (external)	3	2	1						
Phytolaccæ Fructus (seed)	....	1	1						
Rumex (external)	2	....	....	....	....	....	1		
Salvia (stems)	2	1	....	....	....	....	2		
Scammonium	3	....	....	....	....	....	2	1	
Stramonii Semen (black)	....	....	1						
Tamarindus	....	....	....	....	....	....	1	1	
Valeriana (dark)	...	1	....	1	....	....	2		
Vanilla (seeds)	....	....	1	1					
Viburnum Opulus (external)	3	....	1	....	....	....	2	....	2
Viburnum Prunifolium (external)	2	....	1						

XV. *Light-green Group.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Sap green.	Hooker's No. 1.	Hooker's No. 2.	Cadmium yellow.	Payne's gray.	Gamboge.
Absinthium (leaves)	3	2	....	....	1				
Ammoniacum	1	2	3	....	....	4			
Buchu (leaves)	1	....	....	2	2	....	3		
Eucalyptus	1	3	....	....	2	....	....	2	
Eupatorium (flowers)	1	3	....	....	....	2	....	2	
Grindelia (leaves)	2	2	1	....	1				
Humulus (light)	1	....	....	2	....	....	1		
Nux Vomica (internal)	1	....	....	2					
Senna	....	...	....	....	1	....	....	1	2

XVI. *Yellowish Green Group.*

	Chinese white.	Yellow ochre.	Sap green.	Hooker's No. 2.	Gamboge.	Raw umber.	Cadmium yellow.	Vandyke brown.	Sepia.	Lemon yellow.	Hooker's No. 1.	Raw sienna.	Payne's gray.	Burnt sienna.
Allium (internal)	1	2	..	2	2	3								
Anisum	1	2	..	3										
Anthemis (involucre)	1	2	3											
Buchu (yellow leaves)	1	..	3	..	..	..	2							
Calumba (internal and external)	2	..	..	..	..	..	.	1	1	2				
Coca (lower surface)	2	2	..	1	..	..	..	..	..	..	1			
Colocynthis (seeds)	1	2	3											
Cusso	2	2	1	1										
Dulcamara (internal)	1	2	..	..	2									
Eriodictyon (upper surface)	..	..	..	1	..	..	..	..	..	..	..	1		
Eriodictyon (under surface)	1	..	..	2	..	..	..	..	..	..	..	2		
Fœniculum	1	2	..	..	..	..	..	..	..	..	2	..	2	
Hyoscyamus (stems)	3	..	1	..	..	..	..	2	..	..	2			
Lobelia (light)	2	2	..	..	..	..	..	..	..	..	1			
Pulsatilla (stems)	1	2	3	..	..	..	..	..	..	..	3			
Marrubium (leaves and stems)	1	2	3											
Matricaria (involucre)	..	1	1											
Mentha Piperita (stems)	1	2	3											
Mezereum (green)	2	2	..	.	..	..	..	..	..	..	1			
Rubus (internal)	..	1	..	..	..	..	..	..	..	..	1			
Salvia (stems and leaves)	2	2	..	1	..	..	..	..	..	..	1	3		
Santonica (involucre)	2	..	..	..	..	..	..	..	..	..	1	..	..	2
Senna (yellow)	..	..	..	..	1	..	..	..	..	..	2	..	1	
Stramonii Folia (lower surface)	1	..	..	1	..	..	..	..	..	..	..	2		
Strophanthus (green seeds)	1	..	1	..	..	1								
Tanacetum (stems)	1	2	2	..	..	..	..	..	..	..	1			
Uva Ursi (light)	1	1	1	2										

XVII. *Sap Green Group.*

	Chinese white.	Yellow ochre.	Lemon yellow	Gamboge.	Vandyke brown.	Brown madder.	Burnt sienna.	Raw sienna.	Raw umber.	Sap green.	Hooker's No. 1.	Hooker's No. 2.	Prussian blue.	Emerald green.	Payne's Gray.
Ammoniacum	..	..	..	..	..	..	..	..	1	2					
Arnicæ Flores (involucre)	3	..	..	..	2	..	..	..	..	1					
Belladonnæ Folia (upper surface)	..	2	..	..	1										
Cannabis Indica (light)	..	..	..	..	1	..	..	..	..	1	1				
Cannabis Indica	3	..	..	..	1	..	..	..	..	2	2				
Castanea (upper surface)	2	..	..	..	..	..	..	2	..	..	1	1			
Castanea (lower surface)	2	3	..	..	..	..	..	..	..	..	1	1			
Cimicifuga (internal)	1	..	..	..	2	..	..	..	..	..	2	..	2		
Chenopodium (external)	3	..	..	..	..	..	2	..	..	..	2	1			
Chelidonium (leaves)	..	..	..	..	..	..	..	..	2	..	..	1			
Chimaphila (leaves, green)	3	..	..	..	..	..	..	..	..	2	..	1			
Chimaphila (stems, brown)	2	..	..	..	1	..	..	..	..	3					
Coca (upper surface)	..	..	..	..	..	..	..	3	..	1	..	1			

XVII. *Sap Green Group—Continued.*

	Chinese white.	Yellow ochre.	Lemon yellow.	Gamboge.	Vandyke brown.	Brown madder.	Burnt sienna.	Raw sienna.	Raw umber.	Sap green.	Hooker's No. 1.	Hooker's No. 2.	Prussian blue.	Emerald green.	Payné's Gray.
Conium	3	3	..	..	..	..	..	..	..	..	1				
Digitalis (upper surface)	..	..	..	..	..	..	..	..	..	..	..	1			
Digitalis (lower surface)	3	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Dulcamara (external)	..	..	..	..	3	..	..	1	..	..	..	2			
Eupatorium (light)	2	..	..	..	..	1	..	..	..	1					
Eupatorium (dark)	..	..	..	..	2	..	..	..	..	..	1				
Granatum (internal)	1	..	..	3	..	..	..	..	2						
Guaiaci Resina	..	..	..	..	..	2	..	..	2	1	..	1			
Guaiaci Lignum	..	..	..	..	..	..	..	..	2	1	..	.	..	..	2
Hamamelis (lower surface)	1	..	..	..	2	..	..	..	..	2					
Hamamelis (upper surface)	2	..	..	..	..	1	..	..	..	2					
Hedeoma (leaves)	3	..	..	..	..	..	..	..	..	2	1				
Lobelia	..	3	..	..	..	..	..	..	..	2	..	1			
Marrubium (leaves)	..	1	..	..	..	..	..	..	..	1	1				
Matico (dark)	..	..	..	..	..	..	..	..	3	1	..	..	..	..	2
Matico (light)	..	..	..	..	..	..	..	..	2	1					
Melissa (dark)	..	..	..	..	..	1	..	..	..	1					
Melissa (light)	3	..	..	..	..	..	..	..	..	1	..	..	..	..	2
Mentha Piperita (leaves)	3	..	..	..	2	..	..	..	..	..	1				
Mentha Viridis (leaves)	..	..	..	..	2	..	..	..	..	1	..	..	..	..	2
Opium (green)	..	..	..	..	2	..	..	..	..	1	2				
Pepo (internal)	2	..	..	..	..	..	..	..	..	1	..	..	..	..	2
Pilocarpus	2	..	..	..	..	..	..	3	..	..	..	1			
Pulsatilla (leaves)	..	..	..	..	..	..	..	..	..	1	1				
Sabina	2	..	..	..	..	..	..	2	..	..	..	1			
Salvia (leaves)	2	..	..	..	..	..	..	..	..	1	..	..	..	..	2
Scoparius	..	..	..	..	..	..	..	..	2	1					
Scutellaria (light)	..	..	..	..	..	..	..	..	..	2	..	1			
Scutellaria (dark)	.	..	..	..	..	..	..	..	1	2					
Stramonii Folia (stems)	..	..	..	..	..	..	..	..	1	1					
Stramonii Folia (leaves)	3	..	..	..	..	..	..	2	..	..	..	1			

Part II.

In order to make more useful the results of these two papers, we give in the following pages a list of the crude vegetable drugs of the U. S. P. and their internal and external colors, as well as their colors in a powdered condition :

Absinthium : Stems, light yellow ochre; leaves, light green (15); flowers, raw sienna and umber (12). Powder, sap green (17).

Acacia : Luminous yellow (5). Powder, white (1).

Aconitum : External, Vandyke brown (13); internal, light yellow ochre (2). Powder, Vandyke brown (13).

Allium : Fleshy scales, external, white (1); internal, lemon yellow (4) and yellowish green (16); external membranous scales, rose group (7).

Aloe Barbadensis : Raw sienna and umber (12). Powder, dark yellow ochre (3).

Aloe Socotrina : Crude, and powdered drug, Vandyke brown (13).

Aloes (Cape) : Powder, light yellow ochre (2).

Althæa : Crude and powdered, raw sienna and umber (12).

Ammoniac : Yellowish-brown (11); light green (5); sap green (17). Powder, lemon yellow (4).

Amygdala Amara : External, raw sienna and umber (12); internal, white (1).

Amygdala Dulcis : External, raw sienna and umber (12); internal, white (1).

Amylum : Powder, white (1).

Anisum : Light yellow ochre (2). Powder, yellowish-brown (11).

Anthemis : Involucre, yellowish-green (16); ligulate corolla, white (1); tubular corolla; lemon yellow (4); stigmas, light yellow ochre (2). Powder, light green (15).

Apocynum : External, raw sienna and umber (12); internal (wood), lemon yellow. Powder, Vandyke brown (13).

Arnicæ Flores : Flowers, luminous yellow (5); involucre, sap green (17). Powder, yellowish brown (1).

Arnicæ Radix ; External, raw sienna and umber (12); internal, yellowish-brown (11). Powder, sepia (12).

Asafetida : Light yellow ochre (2) and Vandyke brown (13). Powder, dark yellow ochre (3).

Asclepias : External, raw sienna and umber (12); internal, light yellow ochre (2). Powder, raw sienna and umber (12).

Aspidium : External, Vandyke brown (13); internal, lemon yellow (4). Powder, Vandyke brown (13).

Aspidosperma: Wood, light yellow ochre (1). Bark, internal, red group (9); external (bark), raw sienna and umber (12). Powder, raw sienna and umber (12).

Aurantii Dulcis Cortex : External, raw sienna and umber (12); internal, light yellow ochre (2). Powder, raw sienna and umber (12).

Aurantii Amari Cortex : External, raw sienna and umber (12); internal, dark yellow ochre (3). Powder, dark yellow ochre (3).

Belladonnae Folia: Vandyke brown (13). Upper surface, sap green (17). Powder, sap green (17).

Belladonnae Radix: External, raw sienna and umber (12); internal, light yellow ochre (2). Powder, Vandyke brown (13).

Benzoinum : Brown madder (10). Powder, pink (6). Powder, vanilla benzoin, raw umber and sienna (12).

Bryonia : External, yellowish-brown (10); internal, light yellow ochre (2). Powder, raw sienna and umber (12).

Buchu : Light green (15); and yellowish-green (16). Powder, light green (15).

Calamus : External and internal raw sienna and umber (12). Powder, raw sienna and umber (12).

Calendula : Luminous yellow (5). Powder, luminous yellow (5).

Calumba : External, yellowish green (16) ;internal, luminous yellow (5), and yellowish-green (16). Powder, luminous yellow (5).

Cambogia : Yellowish-red group (8). Powder, luminous yellow (5).

Cannabis Indica : Crude and powdered drug; sap green (17).

Capsicum : Pericarp, yellowish-red (8), and raw sienna and umber (12). Seeds, raw sienna and umber (12). Powder, yellowish-red (8). Powder of African capsicum, raw sienna and umber (12).

Cardamomum : Capsules, external and internal, white (1). Seeds, external, raw sienna and umber (12); internal, white (1). Powder of seeds and capsules, pink (6). Powder of seeds, sepia (14).

Carum : Crude drug and powdered drug, Vandyke brown (13).

Caryophyllus : Crude drug and powder, raw sienna and umber (12).

Cascarilla : External and internal, raw sienna and umber (12). Powder, Vandyke brown (13).

Cassia Fistula: Pericarp, external, brown madder (10); pulp, sepia (14). Seeds, internal, light yellow ochre (2); external, raw sienna and umber (12).

Castanea: Crude and powdered drug, sap green (17).

Catechu: Powder, Vandyke brown (13).

Caulophyllum: Rhizome, external, Vandyke brown (13); internal, dark yellow ochre (3). Roots, Vandyke brown (13). Powder, dark yellow ochre (3).

Cetraria: Dark yellow ochre (3) and raw sienna and umber (12). Powder, sepia (14).

Chelidonium: Stems, yellowish-brown (11) and Vandyke brown (13). Leaves, Vandyke brown (13) and sap green (17). Powder, sap green (17).

Chenopodium: External, sap green (17); internal, sepia (14). Powder, dark yellow ochre (3).

Chimaphila: Stems and leaves, sap green (17). Powder, sap green (17).

Chirata: External, Vandyke brown (13); internal, light yellow ochre (2) Powder, dark yellow ochre (3).

Chondrus: Raw sienna and umber (12). Powder, dark yellow ochre (3).

Chrysarobinum:

Cimicifuga: External, Vandyke brown (13); internal, Vandyke brown (13) and sap green (17). Powder, sepia (14).

Cinchona: External, dark yellow ochre (3); internal, red group (9). Powder (yellow) 2, Vandyke brown (13).

Cinchona Rubra: External, red (9) and Vandyke brown (13); internal, raw sienna and umber (12). Powder, raw sienna and umber (12).

Cinnamomum Cassia: External and internal, raw sienna and umber (12). Powder, raw sienna and umber (12), Vandyke brown (13).

Cinnamomum Saigonicum: External and internal, raw sienna and umber (12). Powder, raw sienna and umber (12) and Vandyke brown (13).

Cinnamomum Zeylanicum: External and internal, raw sienna and umber (12). Powder, raw sienna and umber (12) and Vandyke brown (13).

Coca: Lower surface, yellowish green (16); upper surface, sap green. Powder, sap green (17).

Colchici Radix: External and internal, Vandyke brown (13). Powder, sepia (14).

Colchici Semen: External, Vandyke brown (13); internal, raw sienna and umber (12). Powder, raw sienna and umber (12) and Vandyke brown (13).

Colocynthis: Pulp, luminous yellow (5). Seeds, yellowish-green (16). Powder, ligbt ochre (1).

Conium: Crude and powdered drug, Vandyke brown (13).

Convallaria: Raw sienna and umber (12); Vandyke brown (13). Powder, sepia (14).

Coriandrum; Rose (7) and raw sienna and umber (12). Powder, raw sienna and umber (12).

Crocus: Yellowish-red (8). Powder, red (9).

Cubeba: External, Vandyke brown (13); internal, brown-madder (10). Powder, raw sienna and umber (12).

Cusso: Raw sienna and umber (12). Powder, raw sienna and umber (12).

Cypripedium: Raw sienna and umber (12) and Vandyke brown (13). Powder, sepia (14).

Digitalis: Petioles, raw sienna and umber (12); leaves, sap green (17). Powder, sap green (17).

Dulcamara: External, sap green (17); internal, yellowish-green (16). Powder luminous yellow (5).

Elastica:

Ergota: External, sepia (14); internal, dark yellow ochre. Powder, sepia (14).

Eriodictyon : Yellowish-green (16). Powder, sap green (17).

Eucalyptus : Upper and lower surface, light green (15). Crude and powdered drug, sap green (17).

Euonymus : External, Vandyke brown (13); internal, raw sienna and umber (12). Powder, raw sienna and umber (12).

Eupatorium : Flowers, light green (15); leaves, sap green (17). Powder, sap green (17).

Ficus: Seeds, luminous yellow (5); pulp, raw sienna and umber (12).

Fœniculum : Yellowish-green (16). Powder, yellowish-brown (11).

Frangula : External, Vandyke brown (13); internal, yellowish-red (8).

Galla : External, sepia (14); internal, Vandyke brown (13). Powder, dark yellow ochre (3).

Gelsemium : External and internal, raw sienna and umber (12). Powder, dark yellow ochre (3).

Gentiana : External, raw sienna and umber (12); internal, dark yellow ochre (3). Powder, raw sienna and umber (12).

Geranium : External, Vandyke brown (3); internal, raw sienna and umber (12). Powder, Vandyke brown (13).

Glycyrrhiza : External, Vandyke brown (13); internal, lemon yellow (4). Powder, luminous yellow (5).

Gossypii Radicis Cortex : External and internal, raw sienna and umber (12). Powder, raw sienna and umber (12).

Gossypium purificatum : White (1).

Granatum : External, yellowish-brown (11) and Vandyke brown (13); internal, sap green (17). Powder, sap green (17).

Grindelia : Stems, lemon yellow (4) and rose (7); leaves, light green (15). Powder, light green (15).

Guaiaci Lignum : Crude drug and powder, yellowish brown (11).

Guaiaci Resina : Crude and powdered drug, sap green (17).

Guarana : Raw sienna and umber (12). Powder, Vandyke brown (13).

Hæmatoxylon : Yellowish-red (8) and red (9). Powder, red (9).

Hamamelis : Crude and powdered drug, sap green (17).

Hedeoma : Stems, Vandyke brown (13); leaves, sap green (17). Powder, sap green (17).

Humulus : Raw sienna and umber (12), light green (15). Powder, light green (15).

Hydrastis : External, Vandyke brown (13); internal, luminous yellow (5). Powder, luminous yellow (5).

Hyoscyamus : Leaves, Vandyke brown (13); stems, yellowish-green (16). Powder, sap green (17).

Illicium : Fruit, brown madder (10); seed, raw sienna and umber (12). Powder, raw sienna and umber (12).

Inula : External, Vandyke brown (3); internal, luminous yellow (5). Powder, Vandyke brown (13).

Ipecacuanha : External, Vandyke brown (3); internal, raw sienna and umber (12). Powder, dark yellow ochre (3).

Iris : External, Vandyke brown (13); internal, raw sienna and umber (12).

Jalapa : External and internal, Vandyke brown (13). Powder, dark yellow ochre (3).

Juglans : Crude and powdered drug, sepia (14).

Kamala : Powder, red (9).

Kino : Sepia (14). Powder, red (9).

Krameria : External, brown madder (10); internal, red (9). Powder, raw sienna and umber (12).

Lactucarium: Vandyke brown (13).

Lappa: External, Vandyke brown (13); internal, raw sienna and umber (12). Powder, dark yellow ochre (3).

Leptandra: Rhizome, raw sienna and umber (12); roots, brown madder (10) and sepia (14). Powder, Vandyke brown (13).

Limonis Cortex: External, yellowish-red (8); internal, light yellow ochre (2). Powder, raw sienna and umber (12).

Linum: External, raw sienna and umber (12). Powder, lemon yellow (4).

Lobelia: Raw sienna and umber (12); yellowish-green (16). Powder, sap green (17).

Lupulinum: Powder, red (9) and raw umber and sienna (12).

Lycopodium: Powder, light yellow ochre (2).

Macis: Yellowish-red (8). Powder, luminous yellow (5).

Manna: Luminous yellow (5).

Marrubium: Stems, yellowish-green (16); stems and leaves, sap green (17). Powder, sap green (17).

Mastiche: lemon yellow (4). Powder, lemon yellow (4).

Matico: Crude and powdered drug, sap green (17).

Matricaria: Ligulate corolla, white (1); tubular florets, luminous yellow (5); involucre, yellowish-green (16). Powder, dark yellow ochre (3).

Melissa: Stems, rose group (7). Leaves, sap green (17). Powder, sap green (17).

Menispermum: External, Vandyke brown (13); internal, white (1). Powder, dark yellow ochre (3).

Mentha Piperita: Stems, rose (7) and yellowish-green (16). Leaves rose (7) and sap green (17).

Mentha Viridis: Stems, rose (7), Leaves, sap green (16). Powder, sap green (17).

Mezereum: External, Vandyke brown (13); external and internal, Vandyke brown and yellowish-green (16). Powder, dark yellow ochre (3).

Myristica: Raw sienna and umber (12). Powder, raw sienna and umber (12).

Myrrha: Crude and powdered drug, raw sienna and umber (12).

Nux Vomica: External, dark yellow ochre (3); internal, light green (15). Powder, white (1).

Opium: Brown madder (10), sap green (17).

Pareira: External, sepia (14); internal, Vandyke brown (13). Powder, dark yellow ochre (3).

Pepo: External, white (1); internal, white (1) and sap green (17). Powder, light yellow ochre (2).

Physostigma: External, brown madder (10); internal, white (1). Powder, sepia (14).

Phytolaccæ Fructus: Vandyke brown (13). Seed, sepia (14). Powder, sepia (14).

Phytolaccæ Radix: External, Vandyke brown (13); internal, raw sienna and umber (12). Powder, dark yellow ochre (3).

Pilocarpus: Crude and powdered drug, sap green (17).

Pimenta: Pericarp, external, Vandyke brown (13). Seed, brown madder (10). Powder, Vandyke brown (13).

Pix Burgundica: Luminous yellow (5).

Piper: External, sepia (14); internal, Vandyke brown (13).

Piper Album: External, sepia (14); internal, white (1). In powder, light yellow ochre (2).

Piper Nigrum: Crude drug and powder, sepia (14).

Podophyllum: External, Vandyke brown (13); internal, lemon yellow (4). Powder, raw sienna and umber (12).

Prunum : External, raw sienna and umber (12); internal, brown madder (10).

Prunus Virginiana : External, raw sienna and umber (12). Powder, raw sienna and umber (12).

Pulsatilla : Stems, rose (7) and yellowish green (16); leaves, sap green. Powder, sap green (17).

Pyrethrum : External, Vandyke brown (13); internal, light yellow ochre. Powder, Vandyke brown (13).

Quassia : Light yellow ochre (2) and luminous yellow (5). Powder, light yellow ochre (2).

Quercus Alba : Raw sienna and umber (12) and Vandyke brown (13). Powder, raw sienna and umber (12).

Quillaja ; Raw sienna and umber (12). Powder, pink (6).

Resina : Luminous yellow.

Rhamnus Purshiana : External, Vandyke brown (13) and brown madder (10); internal, raw sienna and umber (12). Powder, luminous yellow (5) and raw sienna and umber (12).

Rheum : Raw sienna and umber (12). Powder, yellowish brown (11).

Rhus glabra : External, red (9); internal, Vankyke brown (13). Powder, luminous yellow (5).

Rhus Toxicodendron.

Rosa centifolia : Crude and powdered drug; raw sienna and umber (12).

Rosa gallica : Rose group (7) and raw sienna and umber (12). Powder, rose group (7).

Rubus : External, raw sienna and umber (12); internal, raw sienna and umber (12) and yellowish green (16). Powder, Vandyke brown (13).

Rubus Idaeus.

Rumex : External, Vandyke brown (13) and sepia (14); internal, raw sienna and umber (12). Powder, yellowish brown (11).

Sabina : Crude and powdered drug, yellowish green (16).

Salvia : Stems, sepia (14) and yellowish green (16); leaves, yellowish green (16) and sap green (19). Powder, sap green (17).

Sambucus : Luminous yellow (5).

Sanguinaria : External, Vankyke brown (13); internal, yellowish red (8). Powder, red (9).

Santalum Rubrum : Crude and powdered drug, red group (9).

Santonica : External, involucre, yellowish-green; internal, raw sienna and umber (12).

Sarsaparilla : External, Vandyke brown (12); internal, light yellow ochre (2). Powder (Honduras), Vandyke brown (13).

Sassafras : External, Vandyke brown (13), and raw sienna and umber (12); internal, raw sienna and umber. Powder, raw sienna and umber (12).

Sassafras Medulla: White (1).

Scammonium : Sepia (14).

Scilla : Lemon yellow (4), and yellowish-brown (11). Powder, light yellow ochre (2).

Scoparius : Brown madder (10) and sap green (17). Powder, sap green (17).

Scutellaria : Crude and powdered drug, sap green (17).

Senega : External, rose group (7); internal, lemon yellow (4). Powder, dark yellow ochre (3).

Senna : Light green (14) and yellowish-green (16). Powder, light green (15). Powder of Tinnevelly senna, sap green (17).

Serpentaria : External, Vandyke brown (13). Powder, dark yellow ochre (3).

Sinapis Alba : External, yellowish-brown (11). Powder, light yellow ochre (2).

Sinapis Nigra : External, brown madder (10). Powder, yellowish-brown (11).

Spigelia : Vandyke brown (13). Powder, sepia (14).

Staphisagria : External, Vandyke brown (13); internal, yellowish-brown (11). Powder, sap green (17).

Stillingia : External, Vandyke brown (13); internal, raw sienna and umber (12).

Stramonii Folia : Stems and leaves, sap green (17). Lower surface, yellowish green (16). Powder, sap green (17).

Stramonii Semen : External, raw sienna and umber (12), and sepia (14). Powder, sepia (14).

Strophanthus : External, raw sienna and umber (12); yellowish-green (16). Powder, Vandyke brown (13).

Sumbul : External, Vandyke brown (13), and raw sienna and umber (12); internal, light yellow ochre (2). Powder, Vandyke brown (13).

Tabacum : Raw sienna and umber (12).

Tamarindus : Sepia (14).

Tanacetum : Stems, yellowish-green (16), Vandyke brown (13). Leaves, Vandyke brown (13). Powder, sap green (17).

Taraxacum : External, raw sienna and umber (12); internal, lemon yellow (4) and raw sienna and umber (12). Powder, sepia (14).

Terebenthina : Luminous yellow (5). Powder, lemon yellow (4).

Tragacantha : Lemon yellow. Powder, white (1).

Triticum : Vandyke brown (13), light yellow ochre (2). Powder, raw sienna and umber (12).

Ulmus : Crude and powdered drug, raw sienna and umber (12),

Uva Ursi : Raw sienna and umber (12), yellowish-green (16). Powder, yellowish-green (16).

Valeriana : External, raw sienna and umber (12) and sepia (14). Powder, sepia (14).

Vanilla : External, Vandyke brown (13). Seeds, sepia (14). Powdered vanilla and and sugar, sepia (14).

Veratrum Viride : External, yellowish-brown (11) and Vandyke brown (13); internal, light yellow ochre (2).

Viburnum Opulus : External, sepia (14) and raw sienna and umber (12); internal, red group (9). Powder, Vandyke brown (13).

Viburnum Prunifolium : External, sepia (14) and brown madder (10) and Vandyke brown (13); internal, yellowish-red (8). Powder, raw sienna and umber (12).

Xanthoxylum : External and internal, raw sienna and umber (12). Powder, sap green (17).

Zea : Dark yellow ochre (3) and Vandyke brown (13).

Zingiber : External, luminous yellow (5); internal, light yellow ochre (2). Powder, light yellow ochre.

African Ginger in powder, dark yellow ochre (3).

Conclusion.

In conclusion, we desire to say that while this work may serve as a basis for the uniform description of the crude and powdered vegetable drugs of the United States Pharmacopœia, there is still need for extended work along this line. There is particular necessity for the co-operation of the botanist and chemist in ascertaining the relative activity of the same kind of drug showing different colors or, degrees of color, as Belladonnæ Folia, Rhamnus

Purshiana, Cinnamomum, Strophanthus, Lupulinum, etc. It is furthermore neccessary to study more closely the relation of the fineness of the powder to its color, and the relation of change of color to activity of drug.

The Chair called for the reading of a paper by Mr. Lyman F. Kebler, "Notes on Jalap Roots," etc.

Mr. Kebler presented the paper as follows:

NOTES ON JALAP ROOTS EXAMINED DURING THE PAST SIX YEARS.

BY LYMAN F. KEBLER.

Various authorities differ greatly as to the amount of resin the tuberous roots of Ipomoea Jalap, Nutt, does or should contain. "Guibourt obtained of it 17 per cent.; Umney, 21.5; Squibb, 11 to 16; T. & H. Smith, "not more than 15;" D. Hanbury, 11 to 15.8. Jalap grown in Bonn afforded to Marquart 12 per cent.; a root cultivated at Munich gave Windmann 22 per cent.; from plants produced in Dublin, W. G. Smith got 9 to 12 per cent.; and fine tubers from Ootacamund in India, yielded to one of us 18 per cent. of resin (foot-note, Pharmacographia, 2d edition, 1879, page 445). J. P. Suess considers that the pharmacopœial requirement should be about 8 per cent. W. M. Searby says: "At the present time the jalap of the market will not yield, on the average, more than about 9 per cent. of resin." The German Pharmacopœia, 1890, is satisfied with a drug containing only 7 per cent. The British Pharmacopœia, 1898, states that jalap should yield not less than 9, nor more than 11 per cent. of resin. The United States Pharmacopœia, 1890, requires the tubers to contain not less than 12 per cent., and the French Codex, 1884, fixes the standard at 16 to 18 per cent.

Since it has been clearly shown that jalap, grown under favorable conditions, will readily yield 20 per cent. of resin, the hint has been thrown out that theres in is extracted from the roots before the latter are placed on the market. It must, however, not be forgotten that other varieties of jalap are occasionally substituted for the official species, and it is frequently not an easy matter to differentiate between the several varieties. For example: The official root may be liberally mixed with Tampico jalap, which closely resembles the true jalap in appearance, odor and taste. The tubers of the Tampico are somewhat smaller, more elongated and shrivelled; but tubers of varying sizes and shapes are to be found among any consignment of this drug. Consequently, it is not an easy matter to express an absolute opinion based on these points.

The various writers throughout the country express themselves to the effect that the present available jalap root does not contain sufficient resin to comply with the present United States Pharmacopœia requirements. The writer's experience has been somewhat peculiar with this article, as the reader will very readily see by comparing the following data, obtained during the last six years:

Resin.....	15.35 per cent.	9.75 per cent.	11.07 per cent.
"	8.20 " "	11.52 " "	12.14 " "
"	12.95 " "	13.14 " "	17.00 " "
"	10.53 " "	1.87 " "	9.87 " "
"	15.00 " "	16.58 " "	7.09 " "
"	10.30 " "	8.92 " "	7.87 " "
"	10.50 " "		

The root assaying the highest, namely, 17 per cent., was examined in 1894, and the ether soluble matter was 13⅓ per cent. This, of course, was a very superior product, and since that day not a single sample of equal value has been received. The figures show, however, that very good roots are generally available. The ether soluble matter was not estimated in every case, but wherever it was estimated the amount was well within the limits of the present requirements.

The samples examined since 1894 appeared to continually diminish in percentage of resin, and those examined during the past year are lower than any previously examined. The sample containing 1.87 per cent. resin was decidedly of inferior quality, and was examined during the past year.

From the above results, the writer is of the opinion that the United States Pharmacopœia requirements are slightly rigid, but he does not agree with the various workers in the statement that the official requirement should be low as 8 per cent. It would seem that a standard of 10 per cent. should be fixed, because the above examinations clearly show that articles of such quality can easily be obtained. It should be remembered that if the standard is placed too low, articles of inferior quality will constantly be clamoring for recognition, and in time the market will be flooded with valueless roots.

THE CHAIRMAN: Are there any remarks on this paper?

MR. KENNEDY: I would like to ask the author what the condition was of the root which he examined, in which he found 17 per cent. of resin. I have noticed that with very old roots, where the starchy matter had almost disappeared from worms eating it, the resin percentage was very large, and for this reason I ask the question.

MR. KEBLER: The root was of very good quality—not worm-eaten in the least. It was dry, and of a very superior quality. I may add that the amount of alcoholic extract obtained may vary from twice the amount of resin down. I have found from one and a half to one and two-thirds as much of this extract to the resin, according to the condition of the roots.

MR. DOHME: I have had considerable experience in this matter of jalap roots, and there is often quite a difference between the resin of the jalap and the alcoholic extract —sometimes as much as one hundred per cent. Some specimens of jalap contain much more of this alcoholic extract than of resin. I think, too, with Mr. Kebler, that 12 per cent. is too high for the kind of jalap now in the market. I have found as high as 18 per cent. of pure resin, after being washed repeatedly, but that was many years ago. It is rare now that we obtain jalap-root that will furnish 12 per cent. of pure resin, and I think 10 per cent. would be a very good average to recommend for the Pharmacopœia.

THE CHAIRMAN: This bears out the statement made in the Chairman's address, that the next Pharmacopœia Committee must be very careful about their standards, or they will have druggists prosecuted far selling jalap which should contain 12 per cent. resin when such is almost an impossibility.

The chair called for the reading of a paper by E. M. Houghton on "The Pharmacological Assay of Drugs."

Mr. Houghton read the paper as follows:

THE PHARMACOLOGIC ASSAY OF DRUGS.

BY E. M. HOUGHTON.

Owing to the great interest manifested in the subject of the pharmacologic assay of drugs during the past year, it seems to me advisable to consider some of the fundamental principles underlying such practice, hoping thereby to call forth a free discussion on the question. We have come to believe more and more that with few exceptions substances produce specific pharmacologic action because of their chemical affinity for certain kinds of protoplasm. I employ the word "pharmacology" as meaning "the study of the changes induced in living organisms by the administration in a state of minute division of such unorganized substances as do not act merely as foods" (Cushny). Since the function of the various parts of the animal body depends upon the viability of the protoplasm of the cells composing them, we naturally infer that, when some other substance combines with this protoplasm, the normal physiological process will be altered. This supposition is strongly confirmed if we remember that when the brain is under the influence of caffeine, mental activity is quickened, the caffeine brain protoplasm being less stable than in the normal condition. Chloral produces the opposite action, thought becomes sluggish, and sleep supervenes, the brain protoplasm having become more stable. If strong solutions of caffeine are applied to muscle fibres removed from the animal body, or if they be injected into the intact muscle of the living animal, rigor mortis results. According to Furth, the myogen is transformed into myogenfibrin. Less concentrated solutions increase the irritability of muscle and allow more work to be accomplished in a given time, hence the rational use of substances containing this principle.

Small doses of strychnine increase the reflex excitability of the central nervous system; larger doses may so excite the activity of the nerve cells that the slightest stimulation is followed by a tetanic convulsion. The larger the amount of drug administered, the greater the deviation in the functional activity from the normal. Numerous other similar illustrations might be cited which determine this truth. The function of a given organ is altered in degree but not in kind when under the influence of a drug.

The reflex action of the nerve cells, in the normal condition, or under the influence of strychnine remains a reflex act. "In other words, the action of drugs is quantitative and not qualitative; the activity of living

matter may be changed, but the form which the activity assumes is unchangeable" (Cushny).

Every physician of large practice has come to recognize that the amount of drug prescribed determines the degree of reaction of his patient within certain limits, providing his remedies are uniformly active. There are often exceptions to this rule, but they can usually be satisfactorily explained if sufficient attention is given to the details obtaining in a given case. The physician applies drugs for therapeutic purposes, consequently it should be rememberd that the most important cause for variation in his results is due to the differences in the disease process or processes present in individual patients. The toxins produced by bacteria in an infectious disease may be much more poisonous in one case than in another, as has been thoroughly proven by animal experimentation.

Idiosyncrasy is another important factor to be considered, but this is often the result of some anatomical or physiological variation, a knowledge of which we are not usually able to obtain without considerable trouble.

Individual susceptibility, depending upon variations in race, sex, climatic conditions, environments, etc., likewise is of much importance.

All these influences must be, and are remembered by the successful physician, and all must be remembered by the pharmacologist. The pharmacologist, however, deals with the influence of drugs upon healthy animals, and can vary the condition of his experiments at will, and by appropriate methods can obtain exact records of the reaction of various organs to the influence of medicinal agents; consequently his data upon which to base an opinion are much more exact than those of the therapeutist.

From the physician's point of view in the manufacture of pharmaceutical preparations, uniform pharmacologic activity is of far more importance than chemical purity or pharmaceutical elegance. Thanks to chemistry, it is now possible to satisfactorily determine within certain limits the quantity and quality of most inorganic substances and many of the organic substances employed in medicine.

There are, however, other instances, especially the preparations or the active constituents obtained from plants where it has thus far been found practically impossible to obtain a complete knowledge by this means of the active constituents present.

In certain of these cases it has been thought advisable to determine the amount of total alkaloids, but this kind of assay does not necessarily enable us to guarantee that the pharmacologic properties are the same in different samples, since it is a well-known fact that, where a plant contains several active constituents, all may have the same qualitative action when administered therapeutically to patients or to susceptible animals, but differ largely in their quantitative effects.

Again, in other instances, a plant may contain several alkaloids, the action of one or more of which is practically the opposite of the other contained constituents, and again a determination of the total alkaloids will lead us far astray.

In still other instances it is practically impossible to make an assay, since the active constituents contained are of such a delicate nature that decomposition occurs when they are subjected to the most careful manipulations. Unfortunately, to this group belong some of the most important and active drugs used in medicine, chief among them being the heart tonics, ergot, Indian cannabis, etc. Yet thus far we have not been able to throw the safeguard of a reliable chemical assay around them, and the physician must grope in darkness and danger.

Owing to this condition of affairs, it seemed to me several years ago highly desirable to attempt to guage the active properties of these drugs by a method entirely different from those heretofore employed. After much experimentation, I found it was possible to measure their influence upon certain of the lower animals. Owing to the brief time at my disposal, I shall not enter into the details of this work, as I am getting them in form for publication later.

I have frequently stated that whenever there are known methods of chemical assay for a given drug, which give reliable indication as to the pharmacologic activity, these should be employed instead of experiments on animals, since it should ever be the endeavor of scientists to be as humane as possible, and to resort to animal experimentation only when other means are not available to learn the truth sought. Also, because chemical assay is much less expensive and requires a great deal less time for its accomplishment, but I do not admit that pharmacologic assay is less accurate than a chemical assay in certain instances.

The greatest care should be exercised in selecting types of animals to be employed, since different species react very differently to the same drug. The influence of morphine upon dogs is much like that upon human beings, while cats and guinea pigs react in much the same way to morphine as they do to strychnine. Exhaustive experiments only can determine the kind of animal best suited in a given case. After the proper type of animal has been selected, attention must be paid that they are of the same weight, variety, fed on the same food, approximately the same age, etc. The conditions obtaining during the time of the test should be exactly the same, and the animals should all be kept under the same environments, which should be as nearly as possible that of the normal; however, it is necessary to observe extraordinary precautions to insure best results in certain cases, such as keeping the animals for certain days on special diet, etc.

A large number of animals must be employed and an average of the results determined in order to obtain a knowledge of the pharmacologic

reaction of a normal animal to the drug. In the case of the heart tonics, if frogs are employed and the minimum fatal dose per gramme body weight be the basis of strength two or three dozens may be necessary for each assay. Indian Cannabis will require half a dozen dogs or more, etc.

The mode of administering the drug is of much importance, also, with frogs, the ventral or dorsal lymph sacs offer an easy method of introducing the poison. Rabbits are not suitable for the administration of drugs per stomach, as the accumulated material in the organ will require days for it to become digested; hence the rate of absorption will vary greatly in different cases. The hypodermic method often is useful. In all instances the mode of administration offering the greatest rapidity and certainty of absorption of the drug with the least inconvenience to the animal should be selected. In every instance the action of the drug should be compared with the action of a standard sample. The strength of the standard sample being determined from the data obtained from an examination of a large number of preparations obtained from various samples of drug, and should represent the average strength of the several preparations. If these points are observed when conducting a series of tests upon animals, uniform results will be obtained within certain limits. The limitations will vary with different drugs, which also holds true with a chemical assay.

The results obtained thus far from the use of animals in determining the strength of medicinal agents are well-known in the case of anti-diphtheritic serum. The assay of this remedy, which has proven of such marvelous value in controlling diptheria, has always been based upon the results obtained from experiments upon animals. Several methods are in vogue in different parts of the world, some of which are more accurate than others for fixing the strength of the serum; however, in the several methods employed with one exception, it is necessary to determine first of all the poisonous properties of the diphtheria toxin. Several portions of diptheria toxin are each injected into a test animal, and the minimum fatal dose found. Ten times this quantity of toxin is then measured into each of several small glass capsules containing various amounts of dilute antitoxin. The contents of each capsule is then injected into a test guinea pig.

A portion of the animals never become sick, others are sick and lose in in weight, while the remainder die—the condition of the animals varying in ratio with the amount of serum administered. Ten times the smallest amount of serum protecting the animal from ten times the fatal dose of poison is called an antitoxin unit. Some have accepted this method of assay, but rejected the pharmacologic assay of drugs, claiming that the former is pathologic. Speaking from over five years experience in testing by animal experiments both classes of substances I am of the opinion that the criticism is not well founded on facts.

The poisonous constituents of plants are elaborated by the protoplasm of aggregated vegetable cells, while the active constituents of diphtheria and other toxins are elaborated by the protoplasm of isolated vegetable cells. Hence, a toxin is comparable to a preparation of nux vomica, etc.

The variation in the results obtained from an assay of antitoxin is much greater than in the case of a pharmacologic assay of certain drugs, since various influences, as light, heat, etc., cause a gradual loss in the strength of the toxin and antitoxin, while preparations of drugs are sufficiently permanent to allow us to keep a standard with which we can compare the product being assayed. The assay of the antitoxin is based upon the reaction of three main factors, all of which are variable, namely the test animal, the toxin and the antitoxin, while in the case of most drugs, only one variable factor is present (the test animal), since the preparation usually remains constant.

THE CHAIRMAN: Before discussing this paper, I would like to have presented another on "Physiological *vs.* Chemical and Microscopical Examination of Drugs, by Mr. Lyman F. Kebler.

Mr. Kebler presented the paper as follows:

PHYSIOLOGICAL *VS.* CHEMICAL AND MICROSCOPICAL EXAMINATION OF DRUGS.

BY LYMAN F. KEBLER.

It frequently happens that in the course of an examination of medicinal plants, the investigator must call into use chemical methods, microscopical information and physiological actions.

With such well-known drugs as the leaves of belladonna, stramonium and hyoscyamus, the question occasionally arises, after having established the mydriatic effect, which one is it? Until recent years we have been compelled to rely almost exclusively on chemical examinations, but to-day the microscope can be used to good advantage; yet a case is met with now and then where the microscope fails us, and chemical reactions are not conclusive.

Some time ago the writer was handed a sample of fluid extract of castor oil leaves with the information that it developed symptoms of belladonna poisoning. Upon examination it was found that the fluid extract gave indications of the presence of an alkaloid, and actually did produce mydriatic effects. This was established by carefully extracting the alkaloid from the fluid extract, and administering a neutral salt into the eyes of five different persons, and in each case dilatation of the pupil was the result. Upon examination it was found that some of the same kind of leaves from which this fluid extract had been made were still available. These leaves were now examined for the presence of this same contamination, and it was found also that an alkaloid was present. On extracting the alkaloidal material and administering it to the same persons who had been experimented with above the same results were obtained.

Extensive experiments were next made to establish the presence of a mydriatic alkaloid, in both the leaves and the fluid extract, by the usual chemical reactions, but in no case was it possible to arrive at positive conclusions.

A sample of the leaves was next taken to the late Professor E. S. Bastin with the request that he examine them for the presence of a solanaceous plant. After making several examinations on various samples submitted, he reported to the writer that he was unable to find any contamination in the leaves, and the presence of a solanaceous plant leaf could not be established.

The writer then secured another make of fluid extract on the market, and found that this article gave neither a reaction for an alkaloid nor caused dilation of the pupil when the properly prepared solution was administered to the eye.

Several samples of castor oil leaves, grown by the late Henry Trimble and the writer, were next investigated, with the view, first, of establishing the presence of an alkaloid, and second, to ascertain if any substance could be removed, which, when introduced into the eye, would produce dilation of the pupil. There is considerable evidence to show that an alkaloid is present, but not the least reaction to indicate the presence of a mydriatic alkaloid or a substance that would dilate the pupil when introduced into the eye.

These examinations clearly show that the above fluid extract and leaves must certainly have been contaminated with some foreign leaf or leaves which contained some mydriatic alkaloid, or this unusual reaction must be explained by some other expedient.

There has recently come to the writer another case that appears to be quite unusual in its deportment and cannot be disposed of as we ordinarily try to do. A sample of aconite root of usual quality was examined with the following results:

Gravimetrically it contained 2½ per cent. of total alkaloids; volumetrically it contained about 1½ per cent. of total alkaloids, but according to the physiological test it was impossible to get a greater reaction than 1 in 700, and this was the basis on which the drug was reported. It frequently happens that aconite root assays high chemically and is generally corroborated physiologically.

The writer is aware that the gravimetric methods for estimating the alkaloids of aconite root are defective and volumetric results must be questioned, and it would appear that absolutely no dependence can be placed on them in the above case; therefore, the only means of approximately ascertaining the strength of this sample is physiologically.

Philadelphia, Pa.

THE CHAIRMAN: These two papers are now open for discussion.

I will say that I have just been handed a paper by Henry Kraemer for examination,

and I find it is practically upon this same subject, and if you will allow me I will ask Mr. Edward Kremers to briefly abstract it, and we will consider it in this connection also. The title of the paper is "Assay of Drugs by the use of Living Plants."

Mr. Kremers read the paper in abstract, the full text being as follows:

ASSAY OF DRUGS BY THE USE OF LIVING PLANTS.

BY HENRY KRAEMER.

While I have a certain amount of hesitation in presenting the results recorded in this paper, at the present time, it nevertheless seems to me that more would be gained by such a procedure than by withholding them for a longer time in order to accumulate more data, and in support of this position permit me to quote the following from Montesquieu: "When you treat a subject, it is not necessary to exhaust it, it is enough if you cause thought."

The subject of the testing of drugs by means of their effects upon living plants is not an entirely new one as supposed, as I ventured to state in my paper on "The Valuation of Drugs and Foods" a year ago. In fact, methods of this kind have been employed to a considerable extent in Europe, and appear to be of fundamental importance in ascertaining the toxic properties and therapeutic value of drugs. No less an authority than Kobert, in his "Lehrbuch der Intoxicationen" (1893), says that, after one has obtained the substance relatively pure and made a neutral solution, "Der Gang der Untersuchung ist nun der, dass man erst den Einfluss auf möglichst niedrige Wesen pflanzlicher und thierischer Natur, dann auf höhere kaltblutige und deren einzelne möglichst isolirte Organe oder Stückchen derselben und zuletzt auf die Warmblüter in aufsteigender Reihe untersucht, so dass von Längern erst Pflanzenfresser, dann Fleischfresser, dann Omnivoren, dann körner- und fleischfressende Vögel und erst dann Menschen als Reagens benutzt werden und zwar zuerst der Experimentator, dann andere gesunde Menschen, dann Patienten. *Das Leibmotiv für alle Versuche und namentlich für die Reihenfolge derslben soll das Mitgefühl für die armen gequälten Geschöpfe sein.* Man stellte daher Punkte, welche an niederen Wesen untersucht werden können, nicht ohne Noth an höheren fest. Das am wenigsten gequälte Wesen soll natürlich der kranke Mitmensch sein. Es muss daher als ein Act der Barberei und mangelhaftiger pharmakologischer Erziehung gebrandmarkt werden, dass sich noch immer Aerzte finden lassen, welche Mittel von schwankender oder unbekannter Zusammensetzung und Wirkung sofort an den Patienten ihrer Praxis aufs Gerathewohl hin zu prüfen sich bereit finden lassen."

The following plants or parts of them have been employed in experiments of this kind: Bacteria, Oscillaria, Spirulina, Nostoc, Zygnema, Spirogyra, Chara, Drosera, Tradescantia, yeasts, spores of mucor, Elodea,

Lemna, Pistia, Potamogeton, Myriophyllum, Ceratophyllum, grasses, lentils, beans, peas, etc. (See Kobert, *loc cit.*)

The data herewith presented are the results of experiments which were carried out under my direction by Willard Ohliger in the Botanical Laboratory of the Philadelphia College of Pharmacy. When the work was undertaken it was hoped that a number of drugs could be experimented with and also a number of plants, but up to the present it has been found impossible to extend the experiments further than those which follow. The plants used in these experiments were: Seedlings of *Lupinus albus* and *Pisum sativum*, L. The following are the substances which were used in experimenting upon these plants: Ethyl alcohol, strychnine nitrate, brucine sulphate, tincture of nux vomica, U. S. P., and tincture of nux vomica, free from fat.

METHOD OF TESTING.

The seeds of the above-named plants were first soaked in water for twenty-four hours, after which they were placed on moistened excelsior, arranged in such a manner as to be covered with a bell-jar. This was then placed in a dark room and germination of the seeds allowed to proceed until the radicles acquired a length of from 25 to 30 millimeters. The radicles were then marked with India ink 20 millimeters from their tips and placed in the solutions of the different drugs. The containers used for the solutions were 50 Cc. glass vials, which were perfectly clean. The method found best adapted for supporting the seedlings was as follows: The vials containing the solutions were arranged in a circle on a plate and a large cork placed over them in such a way as to come partly over the mouth of each vial. To this cork the seedlings were attached by means of small staples or double-pointed tacks, so as to immerse the radicles in the solutions. The vials were then covered with a bell-jar and placed in a dark room. After a period of twenty-four hours the seedlings were removed from the solutions, and the radicles carefully measured to ascertain their length of growth. They were then replaced in the solutions and allowed to stand another twenty-four hours, when measurements were again made.

In cases of death the radicles presented a flabby and transparent appearance, and in a few cases they were shorter than at the beginning of the experiment.

In the first series of experiments alcoholic solutions were employed in order to obtain the constant for that liquid, as it was likely to be employed in the preparation of the solutions of the various drugs to be tested.

The following table gives the strength of alcohol employed, the actua growth of two seedlings of *Pisum sativum* and two of *Lupinus albus* in twenty-four hours and the temperature at which the experiments were

performed, this temperature being adopted likewise for the succeeding experiments.

ETHYL ALCOHOL.

Temperature (16°–21° C.). *First 24 Hours.*

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
.01	9. mm. 9. "	Apparently normal	14.5 mm. 15. "	Apparently normal.
.1	10.5 " 11. "	Crooked.	16. " 16.5 "	" "
.5	10. " 10. "	Apparently normal	15.5 " 15.5 "	" "
1.	8.5 " 8.5 "	" "	13. " 14. "	" "
2.	8. " 8. "	" "	11.5 " 12.5 "	" "
3.	6. " 7. "	" "	9. " 8.5 "	" "
4.	4. " 4.5 "	" "	5. " 4.5 "	" "
5.	2. " 2. "	" "	2. " 1. "	" "
6.	1. " 1. "	" "	No growth	Dead, flabby.
7.	No growth	Dead, flabby	—	—

In the foregoing experiments it is seen that no growth of the root occurred in the solution containing 7 per cent. of alcohol, and that in the solutions containing between 6 per cent. and .5 per cent. there was a gradual increase in the length of the root according as the strength of alcohol in the solution was diminished, and that in the solutions containing .1 per cent. and .5 per cent. there was a slight increase in growth over those contained in weaker solutions. It may be stated here that in distilled water *Pisum sativum* grew 18 millimeters and *Lupinus albus* 19 millimeters in twenty-four hours.

In the following table the lengths of the roots at the end of the second twenty-four hours are given :

ETHYL ALCOHOL.

Temperature (16°–21° C.). *Second 24 Hours.*

Per Cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual growth.	Remarks.	Actual growth.	Remarks.
.01	15. mm. 15. "	Apparently normal	19.5 mm. 20. "	Apparently normal.
.1	16.5 " 17. "	Crooked	22. " 22. "	" "
.5	16. " 16. "	Apparently normal	21. " 21. "	" "
1.	13. " 12.5 "	" "	18. " 19. "	" "
2.	11. " 11. "	" "	14.5 " 15.5 "	" "
3.	8.5 " 9.5 "	" "	13. " 13. "	" "
4.	5. " 5. "	" "	5.5 " 5.5 "	" "
5.	2. " 2. "	" "	2. " 1. "	"
6.	1. " 1. "	Flabby	No growth	Dead.
7.	No growth	Dead	—	—

These experiments show that the seedlings growing in the solution containing but .01 per cent. alcohol still grew slightly less than those in the solutions containing .1 per cent. and .5 per cent. alcohol, and that in the solutions containing over 5 per cent. there was no further growth.

In the following experiments aqueous solutions of strychnine nitrate (Merck's) containing the following amounts of the alkaloid to 50 Cc. of distilled water were used: $\frac{1}{30}$ grain, $\frac{1}{20}$ grain, $\frac{1}{15}$ grain, $\frac{1}{12}$ grain, $\frac{1}{10}$ grain, $\frac{1}{5}$ grain, $\frac{2}{5}$ grain, $\frac{3}{5}$ grain, $\frac{4}{5}$ grain, 1 grain.

STRYCHNINE NITRATE.

Temperature (16°–21° C.). *First 24 hours.*

Per cent.	PISUM SATIVUM.		LUPINUS ALBUS.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{30}$ gr. or .0022 gm.	10. mm. 10. "	Apparently normal	15.5 mm. 15.5 "	Apparently normal.
$\frac{1}{20}$ gr. or .0032 gm.	8.5 " 9. "	" "	15. " 15. "	" "
$\frac{1}{15}$ gr. or .0043 gm.	10.5 " 10.5 "	" "	16. " 16. "	" "
$\frac{1}{12}$ gr. or .0054 gm.	6. " 5.5 "	" "	10. " 10. "	" "
$\frac{1}{10}$ gr. or .0065 gm.	5. " 5. "	" "	8.5 " 7.5 "	" "
$\frac{1}{5}$ gr. or .013 gm.	4.5 " 4. "	" "	6.5 " 6. "	" "
$\frac{2}{5}$ gr. or .025 gm.	3. " 3. "	" "	4.5 " 4. "	" "
$\frac{3}{5}$ gr. or .039 gm.	2. " 1.5 "	" "	3. " 3. "	" "
$\frac{4}{5}$ gr. or .052 gm.	1. " 1. "	" "	2. " 2. "	" "
1 gr. or .065 gm.	No growth	Dead, flabby	No growth	Dead, flabby.

It is interesting to note that in the above experiments the maximum growth of both the *Pisum sativum* and *Lupinus albus* occurred in the solution containing $\frac{1}{15}$ grain of the alkaloid, while those in solutions of weaker strength grew slightly less. The solution which proved toxic contained 1 grain of strychnine in 50 Cc. of distilled water.

In the following table the lengths of the roots at the end of the second twenty-four hours are given:

STRYCHNINE NITRATE.

Temperature (16°–21° C). *Second 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{30}$ gr. or .0022 gm.....	16. mm. 16. "	Apparently normal	25. mm. 25. "	Apparently normal
$\frac{1}{20}$ gr. or .0032 gm.....	15.5 " 15. "	" "	24 " 24. "	" "
$\frac{1}{15}$ gr. or .0043 gm.....	17. " 17. "	" "	26. " 26. "	" "
$\frac{1}{12}$ gr. or .0054 gm.....	14. " 13. "	" "	22. " 22. "	" "
$\frac{1}{10}$ gr. or .0065 gm.....	7. " 7. "	" "	9. " 8. "	" "
$\frac{1}{8}$ gr. or .013 gm.....	5.5 " 6. "	" "	7. " 6. "	" "
$\frac{2}{5}$ gr. or .025 gm.....	4. " 4. "	" "	5. " 5. "	" "
$\frac{3}{5}$ gr. or .039 gm.....	2. " 2. "	" "	3.5 " 3 "	" "
$\frac{4}{5}$ gr. or .052 gm.....	1.5 " 1.5 "	Transparent	2.5 " 2. "	Transparent
1 gr. or .065 gm.....	No growth	Dead	No growth	Dead

The above experiments show that the seedlings growing in the $\frac{1}{15}$ grain solution still grew more than those in solutions of $\frac{1}{30}$ and $\frac{1}{20}$ grain, and that in solutions containing between $\frac{1}{15}$ and 1 grain there was a gradual decrease in growth as the amount of strychnine was increased.

The following experiments give the results with solutions of brucine sulphate (Merck's) containing $\frac{1}{30}$ grain, $\frac{1}{20}$ grain, $\frac{1}{15}$ grain, $\frac{1}{12}$ grain, $\frac{1}{10}$ grain, $\frac{1}{8}$ grain, $\frac{2}{5}$ grain, $\frac{3}{5}$ grain, $\frac{4}{5}$ grain, 1 grain in 50 Cc. of distilled water.

BRUCINE SULPHATE.

Temperature (16°–21° C.) — *First 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
1/30 gr. or .0022 gm.	10.5 mm. 10.5 "	Apparently normal	16. mm. 16.5 "	Apparently normal.
1/20 gr. or .0032 gm.	9. " 9.5 "	" "	15. " 15.5 "	" "
1/15 gr. or .0043 gm.	11. " 12. "	" "	16.5 " 17. "	" "
1/12 gr. or .0054 gm.	11.5 " 13. "	" "	17. " 17.5 "	" "
1/10 gr. or .0065 gm.	7.5 " 7. "	" "	10. " 11. "	" "
1/8 gr. or .013 gm.	6. " 6.5 "	" "	9. " 9.5 "	" "
2/15 gr. or .025 gm.	5. " 5. "	" "	6. " 6. "	" "
1/5 gr or .039 gm.	3.5 " 3. "	" "	4. " 4.5 "	" "
1/3 gr. or .052 gm.	2. " 2. "	" "	3. " 3. "	" "
1 gr. or .065 gm.	No growth	Dead	2. " 2.5 "	" "
1 1/5 gr. or .078 gm.	—	—	No growth	Dead.

Comparing the above experiments with those in which strychnine was employed, we notice that the growth of the seedlings in all cases was slightly more than in the corresponding strengths of strychnine, and that death occurred in the solution containing 1 1/5 grain of the alkaloid, whereas with strychnine the toxic percentage was 1 grain in 50 c.c. of water.

The following experiments give the results at the end of the second twenty-four hours:

BRUCINE SULPHATE.

Temperature (16°–21° C.). — *Second 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
1/30 gr. or .0022 gm.	16.5 mm. 16. "	Apparently normal	25.5 mm. 25. "	Apparently normal.
1/20 gr. or .0032 gm.	15.5 " 15.5 "	" "	24. " 24.5 "	" "
1/15 gr. or .0043 gm.	17.5 " 18. "	" "	26. " 26.5 "	" "
1/12 gr. or .0054 gm.	18. " 18.5 "	" "	27. " 27. "	" "
1/10 gr. or .0065 gm.	10. " 10. "	" "	14. " 14. "	" "
1/8 gr. or .013 gm.	8. " 9. "	" "	12. " 12.5 "	" "
2/15 gr. or .025 gm.	6. " 6. "	" "	7. " 7. "	" "
1/5 gr. or .039 gm.	3.5 " 4. "	" "	5. " 5. "	" "
1/3 gr. or .052 gm.	3. " 3. "	" "	3.5 " 3.5 "	" "
1 gr. or .065 gm.	No growth	Dead, flabby	2.5 " 3. "	" "
1 1/5 gr. or .078 gm.	—	—	No growth	Dead, flabby.

In the above experiments, as in those of the first twenty-four hours, we notice an increase over that in the corresponding strengths of strychnine.

A series of experiments upon alcoholic solutions of strychnine nitrate (Merck's) containing $\frac{1}{20}$ grain, $\frac{1}{10}$ grain, $\frac{1}{8}$ grain, $\frac{1}{5}$ grain of the alkaloid to 50 Cc. of the solution were carried out, with the following results:

STRYCHNINE NITRATE AND ETHYL ALCOHOL.

Strychnine nitrate....0.3 gm.
Alcohol, 94 per cent...75 Cc.
Water .....25 Cc.

Temperature (16°–21° C.). *First 24 Hours.*

Per cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 Cc. of sol. or 1 Cc. sol. H_2O q. s. 50 Cc	5. mm. 5.5 "	Apparently normal	9. mm. 9.5 "	Apparently normal.
$\frac{1}{10}$ gr. in 50 Cc. of sol. or 2 Cc. sol. H_2O q. s. 50 Cc	2.5 " 2. "	" "	4. " 4. "	" "
$\frac{1}{8}$ gr. in 50 Cc. of sol. or $2\frac{1}{2}$ Cc. sol. H_2O q. s. 50 Cc	1.5 " 2. "	" "	3. " 3. "	" "
$\frac{1}{5}$ gr. in 50 Cc. of sol, or 4 Cc. sol. H_2O q. s. 50 Cc.	No growth	Dead, flabby	No growth	Dead, flabby.

In the above experiments, the maximum growth of the seedlings occurred in the solution containing $\frac{1}{20}$ grain in 50 Cc. of the alcoholic solution, and death in the solution containing $\frac{1}{5}$ grain.

The following table gives the results at the end of the second twenty-four hours:

STRYCHNINE NITRATE AND ETHYL ALCOHOL.

Strychnine nitrate..... 0.3 gm.
Alcohol, 94 per cent....75 Cc.
Water.....25 Cc.

Temperature (16°–21° C.). *Second 24 hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 Cc. of sol. or 1 Cc. sol H_2O q. s. 50 Cc.	6. mm. 6. "	Apparently normal	14. mm. 15. "	Apparently normal.
$\frac{1}{10}$ gr. in 50 Cc. of sol. or 2 Cc sol. H_2O q. s. 50 Cc.	3. " 3.5 "	" "	5. " 5. "	" "
$\frac{1}{8}$ gr. in 50 Cc. of sol. or $2\frac{1}{2}$ Cc. sol. H_2O q. s. 50 Cc.....	2. " 2.5 "	" "	4. " 4. "	" "
$\frac{1}{5}$ gr. in 50 Cc. of sol. or 4 Cc. sol. H_2O q. s. 50 Cc.	No growth	Dead, flabby	No growth	Dead, flabby.

In the second twenty-four hours we notice a corresponding increase in growth, as was noted in previous experiments.

In the following experiments, alcoholic solutions of brucine sulphate containing $\frac{1}{20}$ grain, $\frac{1}{10}$ grain, $\frac{1}{8}$ grain and $\frac{1}{5}$ grain of the alkaloid to 50 Cc. of the solution were used:

BRUCINE SULPHATE AND ETHYL ALCOHOL.

Brucine sulphate.....0.3 gm.
Alcohol, 94 per cent...75 Cc.
Water .....25 Cc.

Temperature (16°–21° C.). *First 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 Cc. of sol. or 1 Cc. sol. H_2O q. s. 50 Cc.	6. mm. 6. "	Apparently normal	10. mm. 10. "	Apparently normal.
$\frac{1}{10}$ gr. in 50 Cc. of sol. or 2 Cc. sol. H_2O q. s. 50 Cc.	3.5 " 4. "	" "	5.5 " 6. "	" "
$\frac{1}{8}$ gr. in 50 Cc. of sol. or 2½ Cc. sol. H_2O q. s. 50 Cc.	2.5 " 3. "	" "	4.5 " 4.5 "	" "
$\frac{1}{5}$ gr. in 50 Cc. of sol. or 4 Cc. sol. H_2O q. s. 50 Cc.	No growth	Dead, flabby	No growth	Dead, flabby.

In these experiments with brucine, alcohol and water, we again notice an increase in growth over the experiments with strychnine, thus tending to show that brucine is a less powerful alkaloid upon plants than strychnine.

The following table gives the results of the experiments at the end of the second twenty-four hours:

BRUCINE SULPHATE AND ETHYL ALCOHOL.

Brucine sulphate..... 0.3 gm.
Alcohol 94 per cent.... 75 Cc.
Water..... 25 Cc.

Temperature (16°–21° C.). *Second 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 Cc. of sol. or 1 Cc. sol. H_2O q. s. 50 Cc.	7. mm. 7. "	Apparently normal	16. mm. 16. "	Apparently normal.
$\frac{1}{10}$ gr. in 50 Cc. of sol. or 2 Cc. sol. H_2O q. s. 50 Cc.	4.5 " 4.5 "	" "	7. " 7.5 "	" "
$\frac{1}{8}$ gr. in 50 Cc. of sol. or 2½ Cc. sol. H_2O q. s. 50 Cc.	4. " 3.5 "	" "	6. " 6.5 "	" "
$\frac{1}{5}$ gr. in 50 C. of sol. or 4 Cc. sol. H_2O q. s. 50 Cc.	No growtl	Dead, flabby	No growth	Dead, flabby.

In the second twenty-four hours the same conditions remain throughout the experiment; the maximum growth occurred in the solution containing $\frac{1}{20}$ grain and death in the $\frac{1}{5}$ grain solution.

In the following table are given the results with alcoholic solutions of strychnine nitrate and brucine sulphate, contaiuing $\frac{1}{20}$ grain, $\frac{1}{10}$ grain, $\frac{1}{8}$ grain. and $\frac{1}{5}$ grain of the alkaloids in equal proportion to 50 Cc. of the solution.

STRYCHNINE NITRATE, BRUCINE SULPHATE AND ETHYL ALCOHOL.

Strychnine nitrate..... 0.15 gm.
Brucine sulphate..... 0.15 gm.
Alcohol, 94 per cent.... 75 Cc.
Water..... 25 Cc.

Temperature (16°–21° C.). *First 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{20}$ gr. in 50 Cc. of sol. or 1 Cc. sol. H_2O q. s. 50 Cc.	6. mm. 7. "	Apparently normal	10. mm. 11.5 "	Apparently normal.
$\frac{1}{10}$ gr. in 50 Cc. of sol. or 2 Cc. sol H_2O q. s. 50 Cc	3. " 3. "	" "	5. " 5.5 "	" "
$\frac{1}{8}$ gr. in 50 Cc. of sol. or $2\frac{1}{2}$ Cc. sol. H_2O q. s. 50 Cc.	2. " 2. "	" "	3.5 " 3.5 "	" "
$\frac{1}{5}$ gr. in 50 Cc. of sol. or 4 Cc. sol. H_2O q. s. 50 Cc.	No growth	Dead, flabby	No growth	Dead, flabby.

Comparing the above experiments with those of strychnine and alcohol and brucine and alcohol, we observe an increase in the growth of the seedlings over that of strychnine and alcohol, and a slight decrease under that in brucine and alcohol.

The following gives the results with strychnine and alcohol and brucine and alcohol at the end of the second twenty-four hours:

STRYCHNINE NITRATE, BRUCINE SULPHATE AND ETHYL ALCOHOL.

Strychnine nitrate....0.15 gm.
Brucine sulphate.....0.15 gm.
Alcohol, 94 per cent.. .75 gm.
Water ..... .25 Cc.

Temperature (16°–21° C.). *Second 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
1/20 gr. in 50 Cc. of sol. or 1 Cc. sol. H_2O q. s. 50 Cc.	7. mm. 8. "	Apparently normal	1.7 mm. 1.8 "	Apparently normal.
1/10 gr. in 50 Cc. of sol. or 2 Cc. sol. H_2O q. s. 50 Cc.	4. " 4. "	" "	6. " 6.5 "	" "
1/5 gr. in 50 Cc. of sol. or 2½ Cc. sol. H_2O q. s. 50 Cc.	3. " 3. "	" "	4.5 " 4.5 "	" "
1/3 gr. in 50 Cc. of sol. or 4 Cc. sol. H_2O q. s. 50 Cc.	No growth	Dead, flabby	No growth	Dead, flabby.

In the second twenty-four hours the same conditions are evident.

In the following table are given the detailed results with a tincture of nux vomica of U. S. P. strength (0.3 gramme of total alkaloids in 100 Cc. of tincture) from which the oil has been extracted. 13.332 grammes of the powdered drug, the amount used in making 100 Cc. of the U. S. P. tincture, contained .750 gramme of oil, or 5.62 per cent.

Tincture of Nux Vomica (Free from Fat).

Temperature (16°–21° C.). *First 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
1/80 gr. alkaloids in 50 Cc. or ¼ Cc. tinct. H_2O q. s. 50 Cc.	4. mm. 4. "	Apparently normal	9. mm. 9.5 "	Apparently normal.
1/40 gr. alkaloids in 50 Cc. or ½ Cc. tinct. H_2O q. s. 50 Cc.	3. " 3. "	" "	6. " 7. "	" "
1/20 gr. alkaloids in 50 Cc. or 1 Cc. tinct. H_2O q. s. 50 Cc.	2. " 2.5 "	" "	4. " 4. "	" "
1/10 gr. alkaloids in 50 Cc. or 2 Cc. tinct. H_2O q. s. 50 Cc.	1.5 " 1.5 "	" "	2.5 " 3. "	" "
¼ gr. alkaloids in 50 Cc. or 2½ Cc. tinct. H_2O q. s. 50 Cc.	1. " 1. "	" "	2. " 2. "	" "
⅕ gr. alkaloids in 50 Cc. or 4 Cc. tinct. H_2O q. s. 50 Cc.	No growth	Dead, flabby	No growth	Dead, flabby.

In the foregoing, it is seen that no growth of the radicle occurred in the solution containing 4 Cc. of the tincture, and that between 4 Cc. and ¼ Cc. there was a gradual increase in length according as the strength of tincture in the solution was decreased.

In the following experiments are given the results at the end of the second twenty-four hours:

TINCTURE OF NUX VOMICA (FREE FROM FAT).

Temperature (16°–21° C). *Second 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
1/80 gr. alkaloids in 50 Cc. or 1/4 Cc. tinct. H_2O q. s. 50 Cc.	5. mm. 5. "	Apparently normal	15. mm. 15.5 "	Apparently normal.
1/40 gr. alkaloids in 50 Cc. or 1/2 Cc. tinct. H_2O q. s. 50 Cc.	3.5 " 3.5 "	" "	6.5 " 7.5 "	" "
1/20 gr. alkaloids in 50 Cc. or 1 Cc. tinct. H_2O q. s. 50 Cc.	3. " 3. "	" "	5. " 5. "	" "
1/10 gr. alkaloids in 50 Cc. or 2 Cc. tinct. H_2O q. s. 50 Cc.	1.5 " 1.5 "	No further growth	2.5 " 3. "	No further growth.
1/8 gr. alkaloids in 50 Cc. or 2 1/2 Cc. tinct. H_2O q. s. 50 Cc.	1. " 1. "	" " "	2. " 2. "	" " "
1/8 gr. alkaloids in 50 Cc. or 4 Cc. tinct. H_2O q. s. 50 Cc.	No growth	Dead, flabby	No growth	Dead, flabby.

The seedlings in the solutions containg 1/4 Cc., 1/2 Cc. and 1 Cc. of the tincture show a slight increase in growth during the second twenty-four hours, while those in solutions containing 2 Cc. and 2 1/2 Cc. show no further growth.

The following table gives the results with a tincture of nux vomica United States Pharmacopœia strength (0.3 gramme of total alkaloids in 100 Cc. of tincture) from which the fat has not been extracted:

TINCTURE OF NUX VOMICA (FAT.)

Temperature (16°–21° C.). *First 24 hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual Growth.	Remarks.	Actual Growth.	Remarks.
1/80 gr. alkaloids in 50 Cc. or 1/4 Cc. tinct. H O q. s. 50 Cc.	5. mm. 5. "	Apparently normal	10. mm. 10. "	Apparently normal.
1/40 gr. alkaloids in 50 Cc. or 1/2 Cc. tinct. H_2O q. s. 50 Cc.	4. " 4. "	" "	8.5 " 9. "	" "
1/20 gr. alkaloids in 50 Cc. or 1 Cc. tinct. H_2O q. s. 50 Cc.	3. " 3. "	" "	5. " 5. "	" "
1/10 gr. alkaloids in 50 Cc. or 2 Cc. tinct. H_2O q. s. 50 Cc.	2. " 2. "	" "	3. " 3.5 "	" "
1/8 gr. alkaloids in 50 Cc. or 2 1/2 Cc. tinct. H O q. s. 50 Cc.	1.5 " 1. "	" "	2. " 2.5 "	" "
1/6 gr. alkaloids in 50 Cc. or 4 Cc. tinct. H O q. s. 50 Cc.	No growth	Dead, flabby	No growth	Dead, flabby.

Comparing the above results with those of tincture of nux vomica free from fat, it will be seen that there is a slight increase in the growth.

The following table gives the results with tincture of nux vomica (fat) at the end of the second twenty-four hours:

TINCTURE OF NUX VOMICA (FAT).

Temperature (16°–21° C.). *Second 24 Hours.*

Per Cent.	Pisum Sativum.		Lupinus Albus.	
	Actual growth.	Remarks.	Actual Growth.	Remarks.
$\frac{1}{80}$ gr. alkaloids in 50 Cc. or $\frac{1}{4}$ Cc. tinct. H_2O q.s. 50 Cc.	6. mm. 6. "	Apparently normal	16. mm. 16. "	Apparently normal.
$\frac{1}{40}$ gr. alkaloids in 50 Cc. or $\frac{1}{2}$ Cc. tinct. H_2O q. s. 50 Cc.	4.5 " 5. "	" "	9.5 " 9.5 "	" "
$\frac{1}{20}$ gr. alkaloids in 50 Cc. or 1 Cc. tinct. H_2O q. s. 50 Cc.	3.5 " 3.5 "	" "	6. " 7. "	" "
$\frac{1}{10}$ gr. alkaloids in 50 Cc. or 2 Cc. tinct. H_2O q. s. 50 Cc.	2. " 2. "	No further growth	3. " 3.5 "	No further growth.
$\frac{1}{5}$ gr. alkaloids in 50 Cc. or $2\frac{1}{2}$ Cc. tinct. H_2O q. s. 50 Cc.	1.5 " 1. "	" "	2. " 2.5 "	" "
$\frac{1}{3}$ gr. alkaloids in 50 Cc. or 4 Cc. tinct. H_2O q. s. 50 Cc.	No growth	Dead, flabby.	No growth	Dead, flabby.

In these experiments we still notice an increase in the growth of the radicle over that of the tincture of nux vomica free from fat.

CONCLUSION.

At the present time, when the assaying of drugs is of so much importance to the physician and also to the pharmacist, it is needless to say that any methods which will enable us to arrive at results which can be used directly or calculated so as indirectly to be of value to the profession are of considerable importance. The question arises, how can the figures obtained be translated so as to be of practical value. From the results obtained we may say generally that the rate of growth of the radicles in the solutions containing toxic principles is inversely proportional to the toxicity of the solution.

The results of the foregoing experiments tend to show that there is a definite solution of alcohol or nux vomica alkaloids that is toxic, and that in solutions containing different amounts of alcohol or nux vomica alkaloids, there is a definite measure of growth depending upon the quantity contained therein. Inasmuch as this is to be taken as a measure of the amount of alcohol or alkaloids affecting the plants experimented upon, it

is seen that we have here a direct means of measuring the quantity of alcohol or alkaloids in the respective solutions.

MR. WHELPLEY: Speaking more directly to the paper by Mr. Kraemer, I would like to say that the advances made in vegetable physiology and pathology during the closing years of the present century are likely to be noted in times to come as prominent in the strides of this period, and it is fortunate that pharmacy is likely to profit by these investigations. But, as has been pointed out, the investigations are in an experimental stage, and we must not, in our eagerness to find improvements, jump to conclusions. It should, however, cause us to appreciate more fully than we ever have before the sensitiveness of the protoplasm found in the vegetable world, and its ability to respond to stimuli which do not affect the animal protoplasm. This should make us feel more akin to the vegetable world than we are inclined to accept. After all, there is not so much difference between the human being and the cabbage-head. [Laughter.]

The subject of so-called physiological assays of drugs was still further discussed by Messrs. Lyons, Hallberg, Houghton, Bartley and Kebler, the final result of which was rather unfavorable, inasmuch as it was pointed out that the requirements for uniform condition, food, environment, etc., in the case of animals to be experimented upon could scarcely be obtained in human beings, and hence the absence of positive data for guidance in the treatment of the sick. It was admitted that in some cases, as in aconite, physiological tests might prove equal, if not superior, to chemical tests, but that as a whole physiological testing of drugs must prove rather speculative in character.

On motion of Mr. Dohme, the Section then adjourned, to meet at 8 o'clock p. m.

SECOND SESSION—WEDNESDAY EVENING, MAY 9, 1900.

The Section was called to order at 8:15 p. m. by Chairman Ryan.

On motion of Mr. Kebler, the reading of the minutes of the previous session was dispensed with.

THE CHAIRMAN: The order of business now is the election of officers of the Section for the ensuing year. Mr. Oldberg is in nomination for Chairman and Mr. Kebler for Secretary. Are there any other nominations? If not, the nominations will be closed.

No other nominations being proposed, on motion of Mr. Hallberg, it was ordered that the Secretary of the Section cast the vote of the Section for Mr. Oscar Oldberg for Chairman.

Mr. Mayo, Secretary, announced that he had performed that duty.

Mr. Bartley moved that the Secretary also cast the vote of the Section for Mr. Lyman F. Kebler for Secretary of the Section for the coming year, and it was so ordered. Mr. Mayo stated that he had done so.

THE CHAIRMAN: The next order of business is the Reports of Committees. The Report of the Research Committee is in order.

Mr. Lyons presented the report as follows:

REPORT OF THE SPECIAL COMMITTEE OF RESEARCH.

To the Section on Scientific Papers of the American Pharmaceutical Association:

In lieu of the usual report, the Chairman of the Committee on Research offers this year only a few suggestions regarding the possibilities of usefulness in the future of this Committee.

The object that was sought in the original appointment of the Committee was to secure concerted action on the part of those desiring to advance the interests of pharmacy by research work. The Committee, under the able leadership of Dr. Prescott, has already accomplished most valuable results in giving direction to effort, by keeping prominently in view a single important object, viz., the standardization of crude drugs and galenical preparations.

It has facilitated greatly the work of future investigators by its exhaustive collation of the bibliography of the more important drugs which admit of standardization, and it has made accessible to those who have applied in person the fund of information contained in the Lloyd Library.

The burden of planning and carrying on this work has necessarily fallen upon the members of the Committee in unequal degree, and it is easy to understand that for men already bearing heavy loads of individual labor and responsibility, imperative in their demands, it has seemed impossible to carry this added burden. Certainly, to do full justice to such work, and so to give to the Committee the efficiency which its importance demands, calls for more leisure than any active member of our Association can command.

The question has been raised whether under these conditions it would not be better that the Committee be discontinued. Such a course was discussed a year ago, but it seemed better to continue it pending further consideration of its possibilities, even under existing limitations, for usefulness. It was suggested, especially, that an effort be made to secure through this Committee somehow a co-operation of the professions of medicine and pharmacy. There has not been since our last meeting, however, any meeting of the American Medical Association, and so this matter is held in abeyance. That this new link between the two professions may be formed in the near future may be reasonably hoped, if such a step is considered by our Association a desirable one.

Certainly we shall be more likely to receive such co-operative action if we can so formulate a plan for the work of this Committee that it shall appear at once to any association of medical men to be exactly what the medical profession wants.

To give a Committee like ours the standing that it ought to have, it should be able to point to the laboratory facilities for the carrying out of details of investigation. We ought to have our own laboratory, under the direction of a competent man, who should be able to give his whole time to it. I am not sure that this is not within the reach of attainment, but it is certainly as yet only a possibility.

We have not a laboratory of our own, but we have laboratories. It should appear that our Committee does, in fact, command the laboratory facilities of all the schools of pharmacy in the United States. That such is the fact will be shown from year to year by the report of the Committee, which will include an account of all the research work in its immediate line in each of these laboratories.

Now, the medical schools of our country have also laboratory facilities which ought surely to be even better equipped than those of the pharmacy schools. Let the work of these laboratories be also reported year by year by a committee of medical men appointed for that purpose, and the reports of each committee made accessible to pharmacologists in both professions, and a great step in advance will have been secured.

The definite objects sought by our committee must be explicitly stated. It might be

well to name the committee distinctly, "Committee on Pharmacological Research." The scope of its work we may state to be a critical study of the therapeutic agents in common use with reference to their fitness to do the therapeutic work the physician expects from them. This involves for the more active crude drugs a thorough study of assay methods, not so much from the chemical as from the therapeutic standpoint. It involves physiological experiment to verify claims made for remedies newly introduced, as well as to confirm conclusions reached by chemical analysis.

Naturally in the division of labor between pharmacist and physician, the larger share of the purely chemical work would fall to the former, the physiological more especially to the latter, but neither investigation can be complete and satisfactory without the other.

An important part of the work then of the Research Committee would be to report each year the subjects which seem to demand most pressingly immediate and earnest attention. Every year there appear new claimants for a place of prominence in the materia medica. Of these it is certain that the fit only will survive, but the plan at present so largely practised, of determining the fitness by experiment upon patients who are entitled to the best assistance medicine can supply, is one that should receive the attention of those who are so tender-hearted about the suffering of other victims of scientific research—I mean the anti-vivisectionists.

This list, if carefully prepared, should be especially useful in directing the work undertaken by individual members of the Scientific Section.

In addition to this, there should be published by the Committee each year a list of pharmacological queries obtained by conference with physicians in actual practice. Possibly such a list can be furnished by the newly-formed American Therapeutical Society.

An open invitation is always extended to members of the Association to offer suggestions to the committee with reference to profitable directions for research work. Such suggestions may furnish valuable contributions to the list of pharmacological queries which should be annually presented by the Committee.

The research work under the immediate direction of members of the Research Committee will, as in the past, be concentrated on a few definite subjects, to be chosen with reference to their importance, from the standpoint of practical therapeutics.

An important part of the work of the Committee will be to secure efficient co-operative work on each subject chosen, endeavoring in the case, for example, of a crude drug like cascara sagrada, to cover the whole field of its botany, chemistry and physiological toxic or therapeutic activity. The annual report, giving results of such co-operative investigation, cannot fail to be of exceeding value; directly, by rendering possible a scientific use of the drug in question, indirectly, by the object lesson they will afford to those who hereafter shall undertake similar research work.

Just at the present time, it will be certainly in order to concentrate the work of the Committee on some of the numerous problems which will present themselves to the newly appointed Committee on Revision of the United States Pharmacopœia. At least for the coming year, other research work will naturally be laid aside pending the solution of these problems.

Bibliographical work must continue to be an important feature in the contribution which such a Committee as ours can make towards the ends to be kept in view. No part of the proceedings of our Association has greater intrinsic value than the bibliographies already published. It may not be wise always to give such bibliographies space in our Proceedings, for they are "caviare to the general," but they should be made accessible to all who appreciate their value.

I feel sure that if we can go before the Section on Materia Medica and Therapeutics of the American Medical Association, or before the newly-formed Therapeutic Society,

we shall find that a request for co-operation in such a definite plan of work will be met with a hearty response, and it is the conviction of this Committee that the time is opportune for such action on our part.

Regarding the work that has been accomplished by members of the Committee during the year past, the following incomplete summary must suffice. The very early date of our meeting this year has made it impossible for some of the members of the Committee to furnish the more complete details which would be desirable.

Dr. Prescott with his collaborators in the laboratories of the University of Michigan has continued work on the improved process for a simplified Opium Assay after the general method proposed last year by H. M. Gordin. A new plan for the alkalimetric estimation of alkloids had been developed and published by Dr. Gordin. (Pharm. Archives. II, 10, Oct., 1899; Berichte der deutschen chemischen Gesellschaft, 32, 2871, Oct. 27, 1899.)

Work has been done, to be reported at this meeting of the American Pharmaceutical Association, by H. M. Gordin and A. B. Prescott on the "Extraction and Estimation of Colchicine;" by H. M. Gordin on the "Alkaloids of Ceanothus Americanus;" by Paul Murrill and J. O. Schlotterbeck on the "Alkaloids of Bocconia cordata;" by J. O. Schlotterbeck on the "Alkaloids of Adlumia cirrhosa;" by A. B. Stevens on "Wild Cherry Bark and its Preparations."

Dr. Dohme has made studies of the Assay of Aconite (Druggists' Circular, April, 1900), the alkaloidal strength of different kinds of Jaborandi leaves, has contributed a number of papers to the several pharmaceutical periodicals, and offers at present meeting papers on the "Assay of Strophanthus seed," on a "Comparison of Atropa Belladonna with Scopola carniolica roots," and on "Proofs that the alkaloidal residue in correctly made Aconite Assays is Aconitine."

Dr. Rusby reports that progress has been made by him in a study of preparations made respectively from Belladonna and Scopola, the results to be published when the experimental work now in hand is completed.

Mr. Lloyd reports that the Lloyd library has been consulted quite extensively during the year by members of the American Pharmaceutical Association, as well as by other scientists, and that the research work therein is steadily increasing in importance.

The other members of the Committee have not been idle, but prefer that their work shall speak for itself.

Respectfully submitted, A. B. LYONS, *Chairman.*

On motion of Mr. Kebler, seconded by Mr. Eberle, it was ordered that the report be received and referred for publication.

THE CHAIRMAN: The report of the Committee on Chairman's Address is in order, but as the members of the committee are not present, that will be deferred until the next session.

Incidental business is in order. As there does not seem to be any, we will proceed to the reading of papers.

The first paper to be read is one on "Pharmaceutical Bacteriology," by Albert Schneider, who will present the paper in abstract.

Mr. Schneider then presented the paper in abstract, the full text being as follows:

PHARMACEUTICAL BACTERIOLOGY.

BY ALBERT SCHNEIDER, CHICAGO, ILL.

The science of bacteriology is not new, but its introduction into the pharmaceutical curriculum is of comparatively recent origin. There are

as yet only a few colleges of pharmacy where a course in bacteriology deserving of the name is presented. That bacteriology deserves appropriate recognition by the student of pharmacy and the practicing pharmacist is quite generally admitted. It is also evident that this science should be suitably adapted to the science of pharmacy. As medical bacteriology is adapted to the science of medicine, so should pharmaceutical bacteriology be adapted to the science of pharmacy. It shall be the province of this paper to briefly outline bacteriology in its scientific and practical relation to pharmacy.

The student of pharmacy should have a fair knowledge of general bacteriology. He should know what *rôle* bacteria play in the world of life. He will then begin to realize the significance of bacteria in pharmaceutical practice. The student of pharmacy should know what preparations and what medicinal substances are likely to be attacked by these minute organisms and what changes they produce in the substances thus attacked. He should know how medicinal substances are deteriorated and what effects such substances have when introduced into the human organism. The pharmacist should know that bacteria will develop very promptly and profusely in all aromatic waters, in boiled and distilled water; in dilute solutions of all acids and alkalies, alcohol and alcoholic liquids, tinctures, infusions, extracts, solid and liquid, decoctions, plant juices, mucilages, confections, emulsions, elixirs, wines; in salt solutions; in syrups of all kinds; in drugs from the animal kingdom, as pepsin, ox-gall, lard, oils and fats; in vegetable drugs, crude as well as powdered, etc. Only a short time is required for the bacteria to develop in sufficient numbers to render the substances not only inert, but even harmful or poisonous, as the result of the ptomaines generated. The student should understand the use of antiseptics as germ-destroyers, and should know how to prepare and use them. He should understand the preparation of toxins, their use, and how to preserve them. He should have a general knowledge of immunity, natural and acquired. He should understand the relationship of toxins and anti-toxins, and should have a general knowledge of the action of disease-producing germs. It is, however, not practicable or advisable to make an attempt to teach students of pharmacy bacteriology with a view to enabling them to do work in bacterial diagnosis for the practicing physician, as has been suggested by several English and American pharmacists. The preliminary training and education is too elementary, and the best possible course in bacteriology in colleges of pharmacy cannot prepare the student sufficiently in bacteriological technique to do such work satisfactorily. It is not the so called practical side of bacteriology represented by dollars and cents that should interest the pharmacist in this science, but rather the broader view of his chosen professsion, and which enables him to perform his duties more intelligently. The only justifiable and feasible practical work in bacteriology which may

be performed by the practicing pharmacist is the preparation of culture media for the use of physiciaus. Media, properly prepared, placed in test-tubes and sealed with tin-foil and paraffin, may be kept for a year or more without becoming contaminated or losing their nutritive properties, and are always ready for immediate use by the physician.

A course in pharmaceutical bacteriology to meet the present demands may be outlined as follows: Laboratory work, two hours daily, extending over a period of from eight to ten weeks, supplemented by lectures, recitations and assigned collateral reading. The lectures, recitations and reading should cover the ground of general bacteriology, showing that there are beneficial, indifferent and harmful bacteria. No special attention should be given to the scientific classification, and the identification of bacteria, as that is too difficult for a brief course. A few of the more common germs might however be identified. Special attention should be given to an ecological classification and relationship of germs, with a view to recognizing their biological characters. Thus considered, bacteria might be classified as follows:

1. Bacteria of decay, or scavenger bacteria, which make soil possible and thus make it possible for plants and animals to exist. For without bacteria there would be no decay, without decay there could be no soil, without soil there could be no higher plants, and without plants there could be no animals.

2. Bacteria causing fermentation, as for instance those concerned in the souring of ensilage or fodder, those concerned in the curing or sweating of tea, tobacco and cacao, the fermentation of beer and related drinks, the alcohol and vinegar-producing bacteria. Special bacteria are isolated and cultivated to develop the aroma of tobacco, of cheese; they are similarly used in the ripening of cream and the preparation of butter.

3. Bacteria are employed in tanning. Retting or rotting bacteria are active in the manufacture of paper and textile fabrics.

4. Special bacteria are concerned in the souring of milk and cream.

5. Bacteria have been employed with a view of exterminating such pests as chintz bugs, mosquitoes, flies, rats, mice, etc. The chintz-bug exterminating germ has been quite extensively experimented with at several agricultural experiment stations, notably the Illinois and Minnesota stations, but with only partial success.

6. The free-nitrogen-assimilating bacteria found in the root tubercles of the leguminous plants have naturally adapted themselves to these plants, and are of inestimable value. The nitrite and nitrate-forming bacteria are also very important. It is stated on some authority that much, if not most of the saltpetre of South America is of bacterial origin.

7. There are bacteria which cause the deterioration of various substances. For instance, blue milk, stringy milk, milk with a turnip odor, are changes induced by germs. Often a poor grade or quality of beer,

tobacco, cheese is not the fault of the manufacturers, but due to bacterial action initiated in the primarily good article. The deterioration of crude and powdered vegetable drugs is doubtless principally the result of bacterial action.

8. The bouquet or flavor of wines and other alcoholic drinks is supposed to be due to bacteria. The odors of plants are perhaps due to bacterial action.

9. There are numerous bacteria-causing diseases of plants and animals. These deserve special consideration.

10. There are numerous bacteria which occur normally in and upon plants and animals. Each species of plant and animal has, in fact, a bacterial flora peculiar to itself. Again, the bacteria of one organ differ from those of another organ.

11. There are color-producing bacteria, light-producing bacteria, sulphur-producing bacteria and rust-forming bacteria.

Some such a general survey of bacteria will aid in dispelling many of the erroneous conceptions regarding bacteria and their life-work.

The laboratory work should cover the methods of preparing solid and liquid culture media; the preparation of permanent culture media, potato cultures, test-tube cultures, Petri dish cultures, infusion cultures, etc.; methods of filtering and clarifying culture media; methods of sterilizing media and apparatus; methods of staining, fractional cultures, line cultures, etc., stab cultures, high cultures, etc.; the use of indicators, as phenalpthalein, rosolic acid, litmus, etc. It is not advisable to spend any time with inoculation experiments on animals, or the special consideration of disease germs.

The laboratory should be supplied with the necessary apparatus and equipment. Expensive or unusual apparatus are not required. Cleanliness, from the standpoint of the bacteriologist, should be persisted in at every step. The student should be urged to prepare laboratory notes systematically.

The above are mere suggestions which it is hoped may bring the subject of pharmaceutical bacteriology before the profession and invite discussion by those concerned in pharmaceutical education.

THE CHAIRMAN: Gentlemen, you have heard the reading of this paper. It will be accepted if there is no objection. Is there any discussion on the subject? If not, we will proceed to the reading of the next paper on "The Alkaloid of Sambucus Canadensis," by Mr. Alpers.

MR. ALPERS: I wish to say that this is an unfinished paper. I had it in my pocket at Put-in-Bay, and intended to finish it before this meeting, but I have been so much engaged that it has not been possible to do so. But I shall read it anyway, in the hope that somebody else who has more time will take up this work.

Mr. Alpers then read the paper as follows:

THE ALKALOID OF SAMBUCUS CANADENSIS.

BY WILLIAM C. ALPERS.

The Elder Bush, Sambucus Canadensis, is well known in rural domestic practice, where its flowers and berries are highly valued as sudorifics and alteratives. Little, however, is known of the medicinal virtues of the root, Radix Sambuci, although various investigators have expressed the opinion that it probably contains a powerful alkaloid. Prof. De Santes (in Atti di R. Acc., 1895) claims to have isolated an alkaloid resembling coniine, and Prof. Rusby, of New York, in a paper read before the New Jersey Pharmaceutical Association in 1898, also calls attention to the poisonous character of the root.

During the last summer, while staying in the Catskill Mountains, I collected a quantity of the root for the purpose of subjecting it later to an analytical examination. The large inner woody part was at once rejected as inert and only the bark retained. It was necessary to separate the bark soon after digging the root, as it adhered very firmly to the wood in dried samples. On exposing the bark to a temperature of 40 degrees it lost nearly 50 per cent. of its weight. After powdering it had a peculiar odor, reminding of coniine, which grew fainter the older the sample became; it seems, therefore, advisable to use only fresh samples for examination. The following tests were made:

Ten grams finely powdered bark of the root of Sambucus Canadensis were digested with water and 2 per cent. of sulphuric acid for twenty-four hours, and then put in a boiling water-bath for six hours; the liquid was then filtered. It showed a reddish-brown color and acid reaction. An equal volume of alcohol was added, and the mixture allowed to stand for twenty-four hours. After filtration the alcohol was driven off on a water-bath. Tests were now made on watch-glasses with the following reagents: Mayer's reagent, sodium phospho-tungstate, sodium phospho-molybdate, picric acid, tannic acid, gold chloride, potassium tri-iodide. All these reagents gave a decided alkaloidal precipitate.

A second quantity of the drug was treated with petroleum benzin, which had previously been shaken with sulphuric acid and distilled at a temperature below 75 degrees. In general the method was followed that Lyons recommends for the separation of cocaine. After digesting for twenty-four hours with this benzin, to which 5 per cent. of a mixture of absolute alcohol and concentrated ammonia had been added, the clear liquid was decanted with very dilute sulphuric acid. The aqueous liquid was tested with Mayer's reagent, sodium phospho-molybdate and sodium phospho-tungstate. In all cases the characteristic alkaloidal precipitate appeared. Efforts to form crystals with sulphuric and hydrochloric acid failed. When the acid aqueous solution, separated from the benzin, was treated with a drop of ammonia water, a decided odor was noticed, resembling, according to my observation, that of coniine, while other observers, who were

well posted in alkaloidal examinations, thought it resembled nicotine. This odor disappeared on the addition of some diluted sulphuric acid. The suspicion that the alkaloid of sambucus is volatile is hereby strengthened.

At this point the examinations were interrupted. Later on during the winter another sample was examined, but the reactions for an alkaloid were much less distinct.

A pharmaceutical preparation, an elixir, was also prepared and tested physiologically by two medical friends, independently of each other. Both reported that the indications of the presence of coniine existed, but the tests were not sufficient for a final report. The elixir seemed to have anti-neuralgic and anti-spasmodic properties, and to be serviceable in neuralgia, hysteria, nervous insomnia, hypochondriasis, and similar troubles.

THE CHAIRMAN: Without objection the paper will be received to take the usual course. Are there any remarks upon it? If not, we will proceed.

The next two papers were received by the Committee as the result of its efforts to secure a series of papers upon the subject of the practical examination of urine and other substances by the retail pharmacist with the view of showing the practicability of both bacteriological and urinary examinations by the active retail pharmacist. The paper entitled "Urinalysis—By a Pharmacist," by G. W. Parisen, of Perth Amboy, N. J., is in print, and we have it here before us, but as Mr. Parisen is not present it will not be read.

The next one is a paper on "The Examination of Urine, Blood, Sputa and Like Substances by the Practical Pharmacist," by F. W. E. Stedem.

Mr. Stedem read his paper in abstract, the full text being as below:

THE EXAMINATION OF URINE, BLOOD, SPUTA AND LIKE SUBSTANCES BY THE PRACTICAL PHARMACIST.

F. W. E. STEDEM.

It was the writer's intention at first to detail methods of work, but this plan was abandoned after considerable thought. The great number of papers printed on the subject during the past year, and because of the fact that numerous text-books can be had, each of which gives in concise form and in regular order for instruction all the information that could be desired. For these reasons it was deemed best to submit a few comments on the practical utility of this work, to the every-day busy pharmacist as a means of increasing his revenue, and one of the ways of advancing his standing in the community.

It is often objected "that the physician does not appreciate such work on the part of the pharmacist," "that he will accept it all and fail to give credit to the actual worker; that he does not understand the importance of the work itself; that he wants a great deal for nothing, and because of the fact that he gets it for nothing, fails to estimate the work of the pharmacist at its real value." These objections are urged, and rightfully

so, by the men who volunteer to do this kind of work for physicians without cost. I am willing to add to all of these objections and yet strenuously maintain that this work, and more too, may be undertaken and performed by the retail pharmacist not only to his very great advantage, profit and credit, but also as a means of increasing his daily revenue, and yet without making a fixed charge to the physician submitting the work. Many pages might be written in defense of the objections urged, and yet need not have a discouraging effect upon the person interested in this work.

I believe with others that people appreciate more thoroughly and estimate at its real value work done when they are compelled to pay a good price for it, but I also hold that the pharmacist is under a certain obligation, and has responsibilities resting upon him which make it absolutely essential for him to regard in many instances this work as a necessary portion of the work of the day.

It seems to me a proper thing that the pharmacist should look upon himself as the assistant and helpmate of the physician, and that he should so regulate his affairs and perform his work as to make the physicians of his locality regard him as a necessary adjunct to the neighborhood in which he practices. If a man can make himself feel that to the fullest extent, he need never worry himself as to the immediate return for work performed in dollars and cents. I do not mean by this that he school himself to look upon the praise he receives from the physician for work well done as being his only pay, but also the fact that it is certain to bring returns in a good substantial way. It has been my custom for years to remind physicians at regular intervals by means of printed or written communications that I am prepared for and able to make examinations of urine, blood, sputa or any other pathologic material they may see fit to submit for examination. I have always endeavored to make them understand that this work was undertaken with the intention of helping them in their efforts to relieve suffering humanity, and that in no case would a fixed charge be made, except where the financial condition of the patient would permit of the physician collecting the charge from the patient whose condition made the work necessary. It has always been my custom to unhesitatingly undertake any work submitted, no matter what the nature of that work was, provided the physician could give me a clear understanding of what he wanted. I have always maintained that the man of the day responsible for the conduct of the drug store who expects to be successful in his business, must be prepared, through constant study and methodical training, to undertake any item of work comprehended by the whole subject of drug store practice. I mean by this that he should be prepared to do chemical work of any kind; microscopical work should be familiar to him, and that he should be well informed in the principles of bacteriology.

It is proper to remark here that if any one wishes to undertake this

work and instruct himself without recourse to one of the established courses of instruction in our various colleges and universities, that he will meet with many difficulties because of his unfamiliarity with the work, and it is recommended that such a one begin with the simplest forms first and gradually add to the kinds of work he performs until he becomes familiar with the technique required. In deciding on accessory apparatus it is well to keep in mind that most books of instruction outline a very considerable list of apparatus much of which is not actually needed. One should keep constantly in mind the fact that the simplest kind is the best, and the busy worker will soon determine for himself those things which are necessary for him to have. He will also find that in many cases he can construct apparatus which will meet his needs very much better than anything he can buy ready made. If I were called upon to outline a method for a beginner who intended to instruct himself at home, I would advise him to commence with the chemical examination of urine, using as his guide in that work Bartley's "Medical Chemistry" and Tyson's "Practical Examination of Urine." It is altogether likely that if the instructions detailed in these works are carefully followed out and some little time expended in thought as to the methods directed there, the beginner will have a fair understanding of the requirements of urine analysis in a very short time, provided of course that he do some work daily.

Assuming that the man has become proficient in the work of making chemical examinations both quantitative and qualitative for the ordinary normal constituents as well as the abnormal materials which are to be found because of the existence of disease in the patient, he will then pass on to a consideration and study of all these substances by means of the microscope. I know of no better work for the beginner than Frey's "The Microscope and Microscopic Technology," as translated by Cutter, and it is recommended that the beginner study very carefully all those pages relating to the construction and use of the microscope. Having thus informed himself as to the make-up and uses of the instrument which he is expected to handle, let him begin by examining ordinary substances and materials which he can pick up at hand. I have found it a very good method to have beginners study the various parts of the common house-fly, fleas, parts of cock-roaches, the dust of a room, shreds of linen, hair, wool, silk, and cotton fibres, etc. Assuming that he has had sufficient practice with the microscope itself to know how to handle it and take care of it, we will have him go on and examine the sediments found in urine, beginning, of course, with the normal constituents such as epithelia, mucous, phosphatic deposits, etc. After a sufficient amount of work has been done to make the worker proficient, he may go on more or less rapidly to the consideration of the abnormal constituents of urine as produced by diseased conditions of the human organism. If one has not the advantage of a competent instructor to whom he can refer frequently, it would be well to have

color plates of these abnormal constituents to which he could have recourse. A very valuable set of such plates are to be found in Foster's "Medical and Chemical Dictionary." A frequent reference to these plates and to any other illustrations which will assist the worker to differentiate urine deposits is highly desirable. The writer would here remind not only the beginner but the worker accustomed to such conditions of the absolute necessity of performing all microscopical work when in such condition as not to have a prejudiced mind. I mean by this, that one should never determine before hand what he is going to find by the microscope, because of the very great risk one encounters of mistaking many minute organisms and substances for something which he thinks is of pathological interest. It has always been my custom to make microscopical examinations first when the physician has reason to think that his patient might have an inflammatory condition which would be likely to produce casts of any kind in the urine, and then to make the examinations for albumen after having finished the microscopical work. The reason for this being that if you find, as the physician suspects, that the urine contains albumen, you will quite naturally determine in your mind that the man has Bright's disease, and will as naturally search for casts when doing the microscopical work. The proper frame of mind to be in is that which comes from having really no desire to find anything there present except those things which really exist.

With reference to the examination of other pathologic material, sputa blood, pus, etc., all that has been said of microscopic examination of urine will apply to them, and for the same reasons that have been detailed at the beginning of this paper the writer refrains from giving methods of performing these examinations, feeling that it would be taking up the time of the members of this Association uselessly to recount methods which can with much greater advantage be obtained from the numerous text-books on the subject. The writer will later on give a short list of books which will be found very useful to any one desiring to engage in this work whether as a beginner, or as having had experience and desiring more information. He will also add a list of useful apparatus and many necessary instruments required for doing this work conveniently. It occurs to my mind that an appeal to the pharmacists of the United States to more universally engage in work of this kind is not out of order. I would strongly urge upon all of the members of this Association and upon the retail pharmacists of the United States in general the apparent fact that now is the time for them to prove to the physicians and the people upon whom they depend for patronage that they are the intelligent and competent body of men they hold themselves up to be.

I do not believe it is possible to demonstrate one's capabilities in a more definite, useful and profitable way than to be known to be a competent worker in this field. I believe it to be the duty of every pharmacist, a

duty which he owes to himself, to his profession and to the community, to be able to do any kind of analytical work which may be required of him; and that he will profit by his practice of that work is a certainty. I know to a certainty that those pharmacists who have prepared themselves for this work, and practice it, not only are able in many instances to make and collect fixed fees and charges, but that they always have the cream of the prescription business in their neighborhoods, and that it is an unusual thing to hear of a man doing that kind of work complaining of the patent medicine evil, or many other of the disgusting conditions which have been produced by an over-commercialism.

A few words as to work room. The room in which microscopical work is to be done should, if possible, be on the top floor with a northern and western exposure, and so arranged as to be as free from dust as possible. It should be light and airy and have a free good supply of water and be well drained. It should be supplied with a good, strong analytical balance; an abundant supply of test-tubes; a well-made test-tube rack; a stand for burettes, supplied with various sizes of pipettes and burettes. It should have a centrifuge machine geared for either hand power or an electric motor; a hæmacytometer, both for red and white corpuscles; a drying oven; a sterilizing apparatus and an moderate-sized incubator.

Frey's work on the microscope details in a very sensible way the necessary apparatus and adjuncts to the microscope.

For reference books, the writer recommends: "Tyson's Practical Examination of Urine;" Frey, "The Microscope and Microscopic Technology," translated by Cutter; Bartley's "Medical Chemistry;" Abbott's "Principles of Bacteriology;" Holland's "The Urine;" "Common Poisons and Milk;" Sadtler's and Trimble's "Chemistry;" Cabot, "Clinical Examination of Blood;" Halliburton's "Essentials of Chemical Physiology;" Foster's "Medical and Chemical Dictionary;" and strongly urges the study of many articles germane to the work in the journals of pharmacy as printed from time to time.

The following plan for reporting the results of an examination of urine has been found very satisfactory, and its use is recommended:

URINALYSIS REPORT.

Date

Dr.

Patient

Quantity Passed in 24 hours

General Condition

Reaction

Specific Gravity

Albumen

Sugar

Phosphates

Chlorides

Urea

Urates and Uric Acid

Blood

Bile or Matter of

Mucus

Pus

Remarks

Microscopical examination shows the presence of

Remarks

URINALYSIS—BY THE PHARMACIST.

G. W. PARISEN, PERTH AMBOY, N. J.

The analysis of urine by the pharmacist, is a field of labor he can enter with the assurance of becoming competent to do the work satisfactorily.

We are looking every way in these times of close competition to attract trade to our places of business and increase the sales legitimately in our line. Many of the side lines we have been persuaded to put in, seem out of place in business devoted to the Science of Pharmacy, and a small income is derived from their sale considering the time used and the space they occupy, but where to draw the line in this respect is very hard to define. Many pharmacists, especially in smaller towns and cities, have made some examinations of urine for physicians, qualitatively, as to the presence of albumen or sugar, and are not altogether strangers to the method of applying the tests; but to go farther and apply other tests intelligently and be sure of every step of the way, requires a more extended knowledge and experience, especially when is added to the qualitative tests, quantitative analysis and microscopical examination for all the sediments in the urine, which are of so much importance to the physician in his diagnosis.

It will be a great saving of time to any one desirous of doing this work, if he is not a graduate of pharmacy, to attend a special course in some College of Pharmacy and receive instruction in qualitative and quantitative analysis of urine, and careful instruction in the use of the microscope, so that he may be able to determine accurately all the different sediments in the urine.

My experience has been similar to many others, I think, in this respect, for many years having examined specimens for physicians in my city, to determine the presence of albumen or sugar, but when a more extended examination was required, the specimen was sent to New York for examination. This became of such frequent occurrence that I determined to equip myself for the work and keep the trade at home. I found, on inquiry, that the New York College of Pharmacy, in their Post Graduate Course, embraced urine analysis with microscopical examination; so I entered the course for that study, realizing by so doing how little I knew about it before, but I had the satisfaction of knowing when the course was completed that the instruction that I had received fitted me to do the work intelligently. I called the attention of the physicians in our city and those within a radius of thirty miles, to the fact that I had added urinalysis to my other work and was prepared at all times to give the work my personal attention, enclosing them a circular letter with the prices charged, and also a copy of the report sheet showing the different tests employed in the work, and the nature of the report they would receive.

The result cannot be told in direct added income, which in itself has more than paid for the money expended to do the work correctly; the pro-

fessional standing it gives one and the store is very marked and gratifying, and has been the means of added business in many ways. It is also a means of direct advertisement for you, from the physician to the patient, for often some one from the sick room, or the patients themselves will bring you a specimen for examination, and either wait or call for report to take to the physician, and if a prescription is written they will naturally select you to prepare it for them.

The tests that I use are easily prepared, and with a little experience one may become proficient in their use. For albumen, I find the ferrocyanic test the best, and use Heller's or Purdy's test as a balance test. For sugar, I use Haines' test, as it is very sensitive. Fehling's test to verify it is necessary.

For the centrifuge to determine the percentage amount of albumen I use the ferrocyanic test, and while making this test, I employ another tube to sediment a specimen for the microscope.

I would advise the use of a centrifuge, as it saves a great deal of time, and enables you to get the percentage amount of albumen, chlorides, phosphates, and sediments, casts, uric acid, calcium oxalate and foreign bodies quickly.

As a reference book in the work, I prefer Purdy's Urinalysis, but I have several others to consult, if necessary; but Purdy's to me seems the most comprehensive. I have a space in the laboratory reserved for the work, and find many uses for the test solutions in every-day work.

The diazo test suggested by Ehrlich for typhoid fever has proved of great value to the physicians in our city. I have made a great number of tests for them to determine whether the case was typhoid or malarial.

The fact of your being competent to do such work will bring other analytical work to you, and will give you a reputation and professional standing far above the ordinary pharmacist or druggist. There is certainly room for advancement in the professional side of our work, and it will help in a large measure to solve the problem of what shall we do to help ourselves in these days of cutting prices.

Pharmacy to-day is certainly making larger demands than ever before for scientific ability and training, and our Colleges of Pharmacy are keeping pace with the demand, by extended courses of instruction and requirements for more thorough work from its students.

Boards of Pharmacy are asked to keep the standard high, and make the qualifications for examination nothing short of being a graduate of some College of Pharmacy. With all these calls for a higher education sounding through the pharmaceutical circles, every one should try to aid as an individual to bring up the standard of Pharmacy in our land.

THE CHAIRMAN: Without objection, these papers will take the usual course.

Is there any discussion on this very practical subject of urinalysis? If not, I will ask Mr. E. L. Patch to read his paper, which is an "Answer to Queries Issued by the Scien-

tific Section of the American Pharmaceuical Association." I will say in connection with this, that the Committee sent out a few questions upon a subject which they thought pertinent to be considered at this meeting, and this paper contains some of the answers.

Mr. Patch read the following:

ANSWERS TO QUERIES ISSUED BY THE SCIENTIFIC SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

BY E. L. PATCH.

QUERIES.

1. Do you find it impracticable to obtain certain drugs or to manufacture any of the official products to conform with the standards of the United States Pharmacopœia?

2. If so, what drugs or preparations?

3. What standards would you suggest for the same?

These queries cover so extended a field that a complete answer would require more time than the occasion warrants, but the following suggestions will indicate the need of some desirable changes:

Powdered Acacia.

Occasionally contains starch, not in quantity to constitute an adulterant, but possibly derived from following starch in the mill.

Purified Animal Charcoal.

The market furnishes a moist variety containing 75 to 78 per cent. of water, and giving for the dry residue 5 to 8 per cent. of ash. Samples of the dry variety labeled "Purified and U. S. P." gave 17 to 79 per cent. of residue. Washed with HCl and ignited, they gave a residue of 4.6 to 15 per cent. As ordinary animal charcoal varies greatly in character, it should be tested before being purified.

Samples ignited gave 91.48 per cent., 83.38 per cent., 75.15 per cent., 76.16 per cent. and 82.6 per cent. of residue. The same samples, washed with HCl and ignited, gave 10 per cent., 8 per cent., 6.4 per cent., 10 per cent. and 5.8 per cent. of residue. Official standard, 4 per cent. of ash.

Powdered Asafetida.

The Pharmacopœia has a standard of 60 per cent. soluble in alcohol for the whole drug, which is obtainable. Different samples range from 45 to 62 per cent. If the powdered drug is measured by this standard it would all be rejected, as it yields but 21 to 31 per cent. to alcohol.

Citric Acid.

Citric acid usually shows more sulphuric acid than the official limit, and an excess of iron. Lead is occasionally found, but not as freely as formerly.

Tartaric Acid.

Tartaric acid yields sulphuric acid in all cases, and frequently iron, while occasionally it must be rejected on account of the notable presence of copper.

Phosphoric Acid.

Phosphoric acid occasionally contains iron and notable quantities of silica.

Aconite Root.

Physiological test serves for rough estimation only. After one or two applications the average operator cannot measure sensation. 20 bales by the same gravimetric method gave .38 per cent., .4 per cent., .44 per cent., .455 per cent., .46 per cent., .46 per cent., .56 per cent., .58 per cent., .56 per cent., .58 per cent., .6 per cent., .6 per cent., .6 per cent., .62 per cent., .6 per cent., .6 per cent., .7 per cent., .72 per cent., .72 per cent., 8 per cent. Six-tenths per cent. would be a fair standard.

Acetic Ether.

Acetic Ether rarely conforms to the official requirements of 98.5 per cent. of ethyl acetate. The commercial article ranges from 30 to 60 per cent. by the U. S. Pharmacopœia test. If the instructions to use water "just previously saturated with the ether" are carried out, there is no uniformity in the test. If shaken with a sample containing 50 per cent. of alcohol, 25 Cc. of the separated liquid will contain enough alcohol to dissolve a quantity of ether from the sample tested. The water used should be saturated with 98.5 per cent. acetic ether in every case to have uniformity. To obtain the official product the pharmacist must order c. p. acetic ether and pay a proportionate advance in cost. The market c. p. acetic ether ranges from 80 per cent. to 99.2 per cent. by the official test.

Absolute Alcohol.

Absolute alcohol is usually alkaline in reaction.

Aloin.

Aloin at present has a range of 400 per cent. in price. The products are not identical. Some standard should be adopted.

Dried Alum.

Dried alum rarely answers the requirements for solubility, owing to varying proportions of water found in the product, due to faulty preparation, storage, etc.

Ammonium Benzoate.

Ammonium benzoate readily loses enough ammonia to destroy the official requirements for solubility. It might be advisable to direct the careful addition of ammonia to effect a neutral solution.

Ammonium Iodide.

Ammonium iodide frequently is discolored from loss of ammonia and freeing of iodine. If slightly discolored, hydrogen sulphide gas can be passed into a bottle ¾ full of the salt, shaken and the salt spread upon suitable plates to dry. If badly discolored, the U. S. P. process of restoring should be followed. Samples have been observed containing nearly 4 per cent. of ammonium sulphate.

Ammonium Valerianate.

Ammonium valerianate is "very soluble in water" when in normal condition, but stored indefinitely, it loses ammonia and separates insoluble valerianic acid. In effecting solution, enough ammonia should be carefully added to combine with this acid and make a clear solution. The normal salt gives an aqueous solution acid in reaction.

Starch.

Starch should always be tested. It is frequently acid or alkaline in reaction.

Tartar Emetic.

The commercial tartar emetic does not answer the U. S. P. requirements. It contains an excess of iron and arsenic. The official test for arsenic, modified by omitting the "small piece of tin-foil," was applied by Mr. F. T. Drake to 25 market specimens, all of which showed arsenic in quantity from slight trace to large excess. At an advance of a few cents per pound, a product can be obtained that is free from arsenic.

Apomorphine Hydrochloride (not Hydrochlorate).

Officially described as "greyish-white," is so when first made. As found in the druggist's stock, is anywhere from greyish-white to brownish-grey, to dark green. Is the product altered in therapeutic effect by this change in color? If so, how much? When should the pharmacist discard it? We have had testimony of physicians that there is no change in effect; also that there is. Have known the pharmacist to be condemned for dispensing the product that was not greyish-white.

Solution of Hydrogen Dioxide.

It has been stated by Dr. Squibb that the pharmacist cannot make this product from the best of material with scrupulous care and have it retain its strength. A formula should be employed that will obviate this difficulty or a range of strength over a period of time introduced.

Arsenic Iodide.

Arsenic iodide rarely answers the official requirements for solubility, owing to method of preparation and loss of iodine.

Bismuth and Ammonium Citrate.

The commercial article has usually lost ammonia, which must be supplied to effect solution in official proportion.

Sulphurated Lime.

Samples obtained from the American manufacturers assay 20 per cent. to 26 per cent. of calcium monosulphide. One assayed 40 per cent. and one 42.85 per cent. The official requirement is 60 per cent.

Carbon Disulphide.

Commercial usually contains dissolved sulphur, and frequently H_2S. One sample marked "highly rectified," costing three times the usual market price, contained a large quantity of dissolved sulphur, and was very offensive in odor. It can be obtained of United States Pharmacopœia purity.

Copaiba.

Pure products, containing excess of volatile oil, will not answer the official test of ammonia solubility. Such products often yield but 20 per cent. of resin, instead of the average of 40 per cent. obtained from the deeper colored, more viscid varieties.

Sulphate of Copper.

Nearly all market sulphate of copper contains iron. Samples of purified salt usually show traces. To prepare a salt absolutely pure adds largely to its cost. One section of table of tests calls for "absence of iron." Another allows a "limit of iron."

Fluid Extracts.

Several changes could be made in menstrua employed for fluid extracts with advantage. That for uva ursi is too weak in alcohol to extract with readiness. Scutellaria requires a menstruum stronger in alcohol to prevent its precipitating badly.

The following officials change readily:

Fluid Extract	Belladonna Root,	1890	.....	Ppt.
" "	Blackberry Root,	"	.....	Ppt. badly.
" "	Blue Flag,	"	.....	Ppt. badly.
" "	Burdock Root,	"	.....	Ppt.
" "	Cimicifuga,	"	.....	Ppt. badly.
" "	Columbo,	"	.....	Ppt. badly.
" "	Convallaria,	"	.....	Ppt.
" "	Colden seal,	"	.....	Ppt.
" "	Hamamelis,	"	.....	Ppt. and gelatinizes.
" "	Ipecac,	"	.....	Ppt. badly.
" "	Lupulin,	"	.....	Ppt.
" "	Mandrake,	"	.....	Ppt. badly.
" "	Rhubarb,	"	.....	Ppt.
" "	Sarsaparilla,	"	.....	Ppt.
" "	Senega,	"	.....	Gelatinizes.
" "	Sumac Berries,	"	.....	Ppt.
" "	Uva Ursi,	"	.....	Ppt. badly.

Fluid Extracts and Solid Extracts of bright green color should be tested for presence of copper.

Several new fluid extracts should be admitted to secure uniformity of character.

Saw Palmetto.

Saw Palmetto is an example. The five leading market varieties have the following range :

1.	Menstruum	72.55	per cent.	Alcohol by weight		1.6	per cent extract.	
2.	"	49.24	"	"	"	10.	"	"
3.	"	25.24	"	"	"	11.	"	"
4.	"	49.37	"	"	"	24.	"	"
5.	"	26.66	"	"	"	25.6	"	"

Some were freed from oil, some were not.

Moderately dry berries yield to 80 per cent. alcohol about 28 to 31 per cent. of extractive and oil, of which 10 to 15 per cent. is oil. With 68 per cent. alcohol the average yield of extractive with oil is 27 per cent., of which 9 to 12 per cent. is oil.

The difficulty of preparing a suitable extract from fruits containing large proportion of oils, as stramonium, conium, etc , should lead to prior removal of the oil or substitution of some other portion of the drug not open to this objection. Stramonium leaves assay nearly as high as stramonium seed, and the latter often yield 33 per cent. of oil.

Ferric Hypophosphite.

The commercial is frequently much darker in color than the official description. It often contains sulphate.

Lactate of Iron.

Lactate of iron is frequently much darker in color than the official, and less soluble. Lots have been observed, of which 12 per cent. was insoluble in 40 parts water.

Dried Sulphate of Iron.

Commercial dried sulphate of iron often contains an excess of water and assays from 63 to 97 per cent. of official strength.

Glycerin.

Glycerin contains varying proportions of arsenic. Some limit should be fixed. Have had it stated that arsenical poisoning has been produced by a line of fluid extracts containing large quantities of glycerin in the menstrua to give density and greater depth of color with less expenditure of alcohol.

Hyoscine Hydrobromide (*not Hydrobromate*).
Hyoscyamine Hydrobromide (*not Hydrobromate*).

If these alkaloids are identical in therapeutic effect and in composition, why have both official?

Ipecac.

Statements as to its constituent alkaloids vary. Statements as to constitution of alkaloids from different varieties conflict. Have examined samples for importer obtained from different sources, with following results:

Carthagena, 1.22 per cent. to 1.84 per cent. alkaloid.
Blue-blossomed Central American, 0.06 per cent.
White-blossomed Central American, 0.06 per cent.

Rio ipecac yields by same process from 1.6 per cent. to 2.8 per cent. Average of 40 assays, 2.1 per cent. Alkaloidal residues behaved as follows:

	Rio Ipecac.	*Carthagena Ipecac.*
Color	Light yellow,	do.
Water	Almost insoluble,	do.
Alcohol	Soluble,	do.
Chloroform	Soluble,	do.
Ether	Less soluble than in chloroform,	do.
With Dil. H_2SO_4 + HNO_3	Ppt. of nitrate,	do.
With dil. H_2SO_4 + Tannic Acid	White ppt.,	do.
do. — Platinic Chloride	" "	do.
do. + Gold Chloride	Buff "	do.
do. + KOH	White "	do.
do. + K_2CO_3	" "	do.
do. + Picric Acid	" "	do.
do. + Phospho Molyb. Acid	Yellowish-white ppt.	do.
Alkaloid in H_2SO_4	Yellowish-brown,	do.
do. HNO_3	Reddish-yellow,	do.

Jalap Root.

It is hard to meet the U. S. P. requirement of 12 per cent. resin in air-dry root by U. S. P. method. If the percentage is based upon root freed from moisture, it is higher, but does not meet official demands.

Range is 8 to 15 per cent. resin.
Average, 10 per cent. resin.

Kamala.

The official should yield but 8 per cent. of ash. Nine samples from different original sources gave the following:

Sample 1	Costing	$	X	35.5	per cent. ash.
" 2	"	"		29.5	" "
" 3	"	"	X ½	37.5	" "
" 4	"	"	X ½	51.	" "
" 5	"	"	X ½	61.	" "
" 6	"	"	5 X	12.5	" "
" 7	"	"	X ½	16.	" "
" 8	"	"	X ½	24.	" "
" 9	"	"	7 X	2.5	" "

No. 9 was imported from Germany as absolutely pure.

No. 2, assaying 29.5 per cent., was sifted, using lawn cloth, 200 meshes

to the inch. 48 per cent. passed through the sieve and assayed 16 per cent. of ash. Another portion was sifted through a sieve 124 meshes to the inch, and gave 72 per cent. of powder, assaying 16.5 per cent. of ash. The 28 per cent. remaining on the sieve assayed 64.3 per cent. ash.

Manganese Dioxide.

Official calls for 66 per cent. of pure MnO_2. Several samples sold as pure precipitated assayed 65 to 70 per cent. MnO_2. Samples of native tested 70 to 98 per cent.

Methyl Salicylate.

Methyl salicylate can be distinguished from true oil of wintergreen by being optically inactive, while the latter is slightly left rotary. How can methyl salicylate be distinguished from oil of birch, which is also optically inactive?

Morphine Acetate.

This salt loses acetic acid and becomes insoluble. It becomes very dark in color, causing frequent questionings as to its character. It possesses no advantage over the sulphate or hydrochloride unless it consists in its greater solubility in water when *first made*. Why retain it?

Morphine Salts.

Nearly all in the market give a slight pink color with C. P. sulphuric acid. The United States Pharmacopœia permits a faint yellow tint.

Oleoresins.

The commercial frequently show presence of acetone.

Ethereal Oil.

The official product is marketed by only one house in the United States. Much of the Compound Spirit of Ether furnished on the market does not contain the official ethereal oil. It apparently meets all the indications it is prescribed for. Why not omit Ethereal oil and Compound Spirit of Ether?

Oil of Bitter Almond.

Should not a limit of hydrocyanic acid strength be given? Should not the preparations of Wild Cherry be standardized in hydrocyanic acid strength?

Oils of Lemon and Orange.

The Pharmacopœia states that these oils do not develop a terebinthinate taste or odor on standing for some time. Products answering all other tests, sp. gr., optical rotation and solubility, do develop a terebinthinate odor and taste as ordinarily stored.

Oil of Peppermint.

Samples have been condemned as dementholized as a result of applying the U. S. P. test. Examination showed the operators obtained a tem-

perature of but 4° C., with their mixture of snow or pounded ice and salt. If properly arranged—12° C. should be obtained readily, at which the rejected samples met all the U. S. P. requirements. In all such tests the necessary temperature should be indicated.

Podophyllin.

Statements have been made that a difference in yield of about 100 per cent. is brought about by alum precipitation. Conflicting reports are made upon the relative activity of the products.

The Pharmacopœia is in error in stating 15 to 20 per cent. of the product obtained by its process is ether soluble; 65 to 80 per cent. is ether soluble. Methyl alcohol will give nearly as large results in assay methods as as are obtained with ethyl alcohol.

Mr. F. T. Drake found 2 out of 17 samples collected in different localities to be U. S. P. 12 were very inferior. One was powdered mandrake root. One contained a notable quantity of aloin.

Spirit of Nitrous Ether.

The cold process as suggested by various writers during the past three years is better suited for the wants of the pharmacist. Market specimens are not only deficient in ethyl nitrite, but in alcohol.

Precipitated Calcium Phosphate.

Market specimens have been found containing appreciable quantities of talc, calcium sulphate and calcium carbonate with excess of iron.

Syrup of Hydriodic Acid.

Less sugar should be used in its manufacture.

THE CHAIRMAN: If there are no objections, this paper will be received to take the usual course.

It seems to the Chairman that it is quite proper that this paper should be referred to the Committee on Revision of the Pharmacopœia of this Association, as it embodies a great many suggestions which are relevant to the work of that committee.

MR. STEDEM: I would make one objection, and that with reference to the remarks on compound spirit of ether. I don't see why that cannot be prepared as the pharmacist wants it; and why it should be recommended to abolish the compound spirit of ether and the ethereal oil is a little bit beyond my mental grasp.

MR. MAYO: I move to refer without specific recommendation to the Committee on U. S. Pharmacopœia.

The motion was seconded by Mr. Stevens and carried.

THE CHAIRMAN: The next paper is on "Wild Cherry Bark and its Preparations," by A. B. Stevens.

Mr. Stevens read the paper in abstract, the full text being as follows:

WILD CHERRY BARK AND ITS PREPARATIONS.

BY A. B. STEVENS, ANN ARBOR, MICH.

In the work upon wild cherry bark, over two hundred and fifty estimations have been made. It is not the purpose of the writer to burden the Proceedings with a report upon each estimation, but rather to draw conclusions from the results obtained, stating the results in the few cases where it has seemed necessary.

A number of assays were made with the purpose of determining which parts of the bark contained the glucoside. It was found that the outer layer is entirely free from glucoside, the middle layer contains none or at most only a trace, while the inner layer contains practically all the glucoside present. During the removal of the bark from the tree, a very strong bitter almond odor was observed, which entirely disappeared on drying. I thought that by immersing a sample of the fresh bark, immediately upon its removal from the tree, in boiling water and estimating, and then immersing a corresponding sample in cold water and macerating before estimation, that the first would give the acid that was free at the time of collecting, while the second would give the free and also the combined acid which would be liberated during maceration. For these experiments a small tree was cut down and the trunk, which was about four inches in diameter, was taken to the laboratory. When working with dry bark, the duplicate estimation did not vary more than two-tenths of a cubic centimeter of decinormal silver nitrate solution, but when working upon the fresh moist bark from the tree-trunk, our results were so variable that we could not depend upon them, and an effort was then made to find the difficulty. Upon the removal of the outer layer of the bark, I noticed that the middle layer on one side of the trunk was of a yellowish-brown color, while the remainder was of a bright green. It then occurred to me that the bark upon different sides of the tree might vary in strength. This was found to be true, the yellowish-brown bark being much weaker than the green. A large number of trees were then examined, and it was found that in young trees in the open, unprotected either by adjacent trees or by overhanging branches, that the south side was either yellowish-brown or a much lighter shade of green than the north, and that it contained less glucoside. In the experiments with fresh bark, with boiling water, the results were not quite those anticipated. Therefore, the dry bark, which assayed 0.082 per cent. of hydrocyanic acid, was placed in boiling water and estimated. This gave 0. 027 per cent., or one-third of the total hydrocyanic acid. Then ten grammes of bitter almonds, which assayed 0.245 per cent. of hydrocyanic acid, were crushed and placed directly in boiling water and estimated. The yield was 0.026 per cent. of hydrocyanic acid. Half a gramme of amygdalin was then treated in the same manner as the almonds, except that the distillation was continued much longer, but no hydrocyanic acid was liberated. From the above it

appears that a portion of hydrocyanic acid in wild cherry bark, and also in the almond, must either exist free or in a very feeble combination.

FLUID EXTRACT.

The work upon the galenical preparations of wild cherry bark was undertaken for the sole purpose of ascertaining the relative keeping-qualities of the bark and its preparations. However, upon assaying a sample of recently prepared fluid extract and syrup, I was somewhat surprised to find that these samples contained only about one-eighth to one-fourth the hydrocyanic acid which the bark originally contained. Three fluid extracts were very carefully prepared from bark assaying 0.078 per cent. of hydrocyanic acid. The first was prepared by the pharmacopœial method: the second by Diehl's method, using the pharmacopœial menstruum; the third by the pharmacopœial method, substituting ten per cent. acetic acid in place of the alcohol. These were assayed with the following results:

Pharmacopœial Method	0.0095 per cent.
Diehl's Method	0.0164 " "
Acetic Acid Method	0.0229 " "

From these estimations it is evident that something is wrong either with the menstruum used or with the method employed, or with both. To solve the difficulty the following experiments were performed for the purpose of ascertaining the amount of menstruum required to liberate the maximum amount of acid during maceration. The menstruum used was the pharmacopœial menstruum, containing one part of glycerin to two parts, by volume, of water. The first sample was macerated with the quantity directed by the Pharmacopœia, and the amount of menstruum increased with each succeeding sample. These macerations extended over a period of forty-eight hours, and were then estimated with the following results:

| | | |

10 Gm. in 100 Cc. of water.....0.129 per cent. HCN.
10 " " " 10 per cent. Alcohol.....0.128 " "
10 " " " 20 " " .....0.126 " "
10 " " " 30 " " .....0.118 " "
10 " " " 40 " " .....0.118 " "

10 Gm. in 34 Cc. of Glycerin
66 " Water } 0. 128 per cent. HCN.

10 Gm. in 10 Cc. of Glycerin
28 " Acetic Acid
62 " Water } 0.100 per cent. HCN.

10 Gm. in 10 " Glycerin
15 " Alcohol
75 " Water } 0.125 per cent. HCN.

10 Gm. in 10 Cc. of Glycerin
20 " Alcohol
70 " Water } 0.125 per cent. HCN.

Thus it appears that a menstruum containing as high as 20 twenty per cent. of alcohol may be used without materially affecting the action of the ferment. A fluid extract was prepared by the pharmacopœial method, using the same bark, and a menstruum in the proportion of 10 Cc. glycerin, 15 Cc. alcohol and 75 Cc. water. The bark was moistened with 300 Cc. of menstruum, firmly packed in a percolator, menstruum added to cover the drug, and after maceration percolation was started, the first 850 Cc. of percolate was reserved. Percolation was continued until the bark was exhausted, and the percolate evaporated as directed by the Pharmacopœia, the soft extract was assayed and found to be without a trace of hydrocyanic acid. The finished fluid extract contained 0.065 per cent. of hydrocyanic acid, equal to about 51 per cent. of the acid in the bark. Bark and menstruum of the same strength were used in the manufacture of a fluid extract by Diehl's method. The extract assayed 0.097 per cent., which equals about 76 per cent. of the acid in the bark. Squibb's method was next tried, using bark and menstruum of the same strength with precisely the same result. Another fluid extract was prepared by Squibb's method, using bark of the same strength, but employing a menstruum in the proportion of 28 Cc. acetic acid, 10 Cc. glycerin and 62 Cc. water. The finished fluid extract assayed 0.094 per cent. hydrocyanic acid, which is equal to about 76 per cent. of the acid in the bark. While the above method secures only about three-fourths of the acid in the bark, it is a decided improvement over the pharmacopœial method, which, at the best, produces a fluid extract representing only about one-eighth of the strength of the bark. In this connection it will be of interest to note the strength of the fluid extracts of the market, therefore ten samples were obtained from leading manufacturing houses and examined with the following results. All of the samples examined were in original unbroken packages.

No. 1 contained	0.024	per cent of acid.	No. 6 contained	0.048	per cent. of acid.
No. 2 contained	0.0054	" "	No. 7 contained	0.038	" "
No. 3 contained	0.02	" "	No. 8 contained	0.048	" "
No. 4 contained	0 022	" "	No. 9 contained	0.027	" "
No. 5 contained	0.016	" "	No. 10 contained	0.031	" "

Fluid extracts of wild cherry bark, like the official hydrocyanic acid rapidly lose strength after the bottles have been opened for use. Samples from two fluid extracts which had been in stock for some time were carefully assayed. Only one contained a trace of acid, while the other contained none at all. Another extract lost two-thirds of its acid in three months, and still another which originally containing only 0.0095 per cent. after three months, scarcely contained a trace of the acid. A fluid extract made with acetic acid kept somewhat better, but at this point I am not prepared to make authentic statements concerning keeping qualities of a good extiact made with a weak alcoholic menstruum, and one made with acetic acid. I believe, however, that it will be slightly in favor of the latter. From the preceding experiments it is fair to conclude that to obtain the largest yield of hydrocyanic acid the bark must be moistened and packed in the percolator and covered with the menstruum before maceration that the pharmacopœial method must be abandoned and either Squibb's or Diehl's method be substituted; also that the finished product must be preserved in small, well-filled bottles securely protected from the light.

SYRUP OF WILD CHERRY.

The bark used in the manufacture of the following syrups assayed 0.128 per cent. of hydrocyanic acid. Theoretically, this should furnish a syrup containing 0.0194 per cent. of HCN. Two syrups were prepared, following very carefully the pharmacopœial method. The first contained 0.0057 per cent. of acid, the second 0.0059 per cent. of acid, which is less than one-third of the theoretical yield. Doubtless much hydrocyanic acid is lost in transferring from the covered dish after maceration to the percolator. Also the quantity of menstruum used in maceration is too small. Syrup made with acetic acid after "Haussman's formula" (Am. Jour Pharm., lxxii. 69), the drug being macerated in the percolator before packing, assayed 0.0081 per cent. A syrup made after the pharmcopœial method, with the difference that the drug was macerated in the percolator before packing, assayed 0.0115 per cent.

Two syrups were next prepared by moistening the bark and packing at once in a percolator, adding sufficient menstruum to cover the bark, and allowing it to macerate twenty-four hours. The sugar was placed in a graduated receiver and the bark percolated direct upon the sugar to the desired volume. The two syrups assayed 0.0162 per cent. and 0.017 per cent. respectively. As these results approximate the theoretical yield, the method may be considered as satisfactory. The same method was used

in the manufacture of a syrup with a menstruum composed of twenty per cent. of glycerin and two per cent. of acetic acid. The finished syrup assayed 0.0161 per cent. The syrup made with acetic acid menstruum does not seem to possess any special advantages over that made with the official menstruum, unless it should prove to be more permanent. It has the disadvantage of being incompatible with ammonium carbonate, which is sometimes prescribed with syrup of wild cherry.

I desire to acknowledge my indebtedness to G. M. Heath, Ph. C., for assistance in many of the experiments.

THE CHAIRMAN: I am sure any light upon the subject of the pharmacy of wild cherry is very acceptable. It is a very troublesome drug, and one the pharmacy of which is not in a satisfactory state.

MR. CASPARI: I have listened with much interest to the remarks made by the author in regard to this question of wild cherry bark, because what he says conforms to the experiments we have made at the College for a number of years past, and as far back as 1893 I suggested the identical menstruum that has now been suggested by Mr. Stevens and his associates, that is, two parts of glycerin, two of alcohol and six of water; Mr. Good, of St. Louis, in 1897, proposed the same menstruum for fluid extract of wild cherry bark. For a number of years our students have used that menstruum, and with far better results than obtainable by any other method. I am glad that the figures as to extraction of hydrocyanic acid, mentioned by Mr. Stevens, are so favorable, and it seems possible by this method that all the hydrocyanic acid can be extracted. There is no doubt that, judging simply by the taste and odor, the preparation is far richer in hydrocyanic acid than when made by the Pharmacopœia method.

THE CHAIRMAN: What is the keeping quality of this?

MR. STEVENS: So far we have not kept the preparations as long as we should like, but we shall be able to report on them almost any time hereafter. As yet there is no sign of precipitation; they are very clear, indeed.

THE CHAIRMAN: The Chair finds that we shall be able, by the use of our next session on Friday, to complete the work of the Section, and with the reading of the next paper if the meeting so desires, we can adjourn and give time to attend the reception at the Governor's mansion.

I will ask Mr. Caspari to read a paper on "Atropa Belladonna or Scopola Carniolica," by Alfred R. L. Dohme and H. Engelhardt.

MR. CASPARI: Mr. Chairman, it will afford me pleasure to read this paper for Mr. Dohme, who is unavoidably absent. I think he has devoted considerable work to an investigation of the subject.

Mr. Caspari then read the paper as follows:

ATROPA BELLADONNA OR SCOPOLA CARNIOLICA.

BY A. R. L. DOHME AND H. ENGELHARDT.

Of all the potent drugs in the Pharmacopœia perhaps none of those that have no official standard is more in need of one, or has been more freely discussed than belladonna root. Belladonna certainly needs a total alkaloid standard of strength, and will, in all probability, be the first

of the non-standardized drugs in the Pharmacopœia to receive a standard and an assay-process. Up to now it has been the Atropa Belladonna that has been regarded as the only official mydriatic root, although several trustworthy reports appeared during the last ten years to point out that the so-called Scopola Root (also comercially called Atropa Mandragora or false Belladonna Root, and undoubtedly so in error) is as efficient a mydyriatic as is Atropa. Habit, custom or prejudice cannot stem the current of facts, and no matter how fixed has become the notion that Atropa is the only trustworthy mydriatic, if it can be shown that the despised Scopola, that has been sailing under "false" colors for so long, is richer in mydriatic alkaloids than Atropa, and produces the same therapeutic effects and results as does Atropa, Scopola will replace Atropa in the Pharmacopœia. There is no question of this. We have outlived to a large extent the prejudices that characterized our forefathers, and, to a considerable extent, still characterize many of the pharmacists of to-day. Facts are what obtain to-day. If it is a fact that scopola is a more powerful mydriatic than Atropa and produces the same therapeutic effects, only more so, then Scopola will obtain henceforth, at any rate until another mydriatic comes to the fore and displaces it. What are the facts? Therapeutically, the consensus of medical opinion is that scopola alkaloids are a more efficient mydriatic, and produce less unpleasant effects than do the alkaloids of Atropa. Atropa contains atropine and hyoscyamine, and scopolamine, which latter is a mixture of hyoscine and atroscine. Hesse has shown that atroscine is the most efficient and prompt of all mydriatics. So, therapeutically speaking, Scopola has the better argument. Let us look to the chemistry of the two, and see if that also points in the same direction. Some five years ago we assayed both Atropa and Scopola, and found that the latter was richer in alkaloids than the former. The results were never published, and we paid little attention to the results. This time we have paid more attention to the results, and can state that they confirm those of five years ago. The method of assay used was that of C. C. Keller, and it worked successfully and smoothly. The results are:

Atropa Belladonna Root (*a*) 0.488 per cent. total alkaloids by titration.
(*b*) 0.489 " " "
(*c*) 0.502 " " "

These assays were made in triplicate, *i. e.*, *a*, *b* and *c* all are assays of the same drug made at different times. The drug powder we used was the result of mixing pieces from various samples of various lots of the white split genuine Atropa Belladonna root and powdering and remixing the powder thoroughly. It should hence be a representative sample of well-dried, sound, genuine Atropa Belladonna root.

Scopola Carniolica Root (*a*) 0.613 per cent. total alkaloids by titration.
(*b*) 0.612 " " "
(*c*) 0.613 " " "

The Scopola root used was, as in the case of the Atropa root, the result of mixing sample pieces from various lots of the typical root as it comes to this market, and powdering the mixture to a number 40 powder. Whether or not the root was Scopola Carniolica, or some other variety of scopola, was not determined, but it was a fair sample of the Scopola Root of commerce of to-day. We see from the results of the assays that chemsitry has spoken in the same way as therapeutics, and the result appears to point to the conclusion that the much despised and "false" Scopola is preferable for use as a mydriatic root to Atropa. Before it can be said that it is preferable and should supersede Atropa, more assays of various samples must be made, and additional therapeutic investigations must prove the identity of its action upon the animal body. The resulting alkaloidal mixtures from these assays were examined qualitatively for atropine, and both those from Atropa and Scopola gave reactions for atropine. They were not examined for hyoscyamine, hyoscine or atroscine as characteristic color reactions, for these in the presence of atropine were not known to us. We hope to be able later to obtain some additional light upon the relative nature of these alkaloidal residues from the assays of the two roots.

Baltimore, May 5th, 1900.

THE CHAIRMAN: Without objection, this paper will take the usual course, and it is open for discussion.

MR. WILLIAMS: If I understood correctly, the averages which Mr. Dohme obtained were 0.50 for atropa belladonna and about 0.60 for scopola. In 1890 I presented a paper to this Association in which I stated that the relative yield of alkaloid which we had found was about 0.50 for atropa belladonna and 0.58 for scopola—the work on scopola representing about 16 tons of the rhizome in about 27 operations.

MR. SAYRE: Mr. Caspari in reading that paper referred to Keller's process. Is it stated in the article itself where that process is published?

MR. CASPARI: No, sir: but the process is published in the Proceedings of this Association several years back—within the past four or five years, I should say.

THE CHAIRMAN: This subject, at the present time, seems to be a very important one, and, as I understand, the investigations are being carried on with the view of definitely determining the relative position of each of these alkaloids and their value. I had hoped to have at this meeting a very complete series of papers on this subject, but unfortunately, on account of the early meeting we hold this year, the writers were not able to complete them. But when they are completed I am sure they will be presented to the Scientific Section of this Association, and we shall have the credit of them.

The Chair, after announcing a lecture on "Wireless Telegraphy" on Friday evening, by Prof. William Simon, of Baltimore, to be given under the auspices of the Scientific Section, to which the members of the Association and the ladies were invited, said he was now ready to entertain a motion to adjourn, to meet Friday morning at 9 o'clock.

Mr. Hallberg moved to adjourn accordingly, and the motion prevailed.

THIRD SESSION—FRIDAY MORNING, MAY 11, 1900.

Chairman Ryan called the Section to order at 9 : 15 a. m.

On motion, the reading of the minutes of the previous session was dispensed with.

The Chair stated that the order of business was the reading of papers, continued from the last session, the first paper called for being one entitled "A So-Called Ipecac (Polygala angulata, D. C.)," by Henry Kraemer.

Mr. Kraemer not being present, Mr. Bartley presented the paper in abstract, the full text being as follows:

A SO-CALLED IPECAC (POLYGALA ANGULATA D. C.).

BY HENRY KRAEMER.

The genus polygala is represented by between four and five hundred species, of which one-half are indigenous to America. Dragendorff (Die Heilpflanzen, 1898) mentions about forty species, which are said to possess similar properties to *Polygala Senega* L. Others possess pronounced expectorant properties, as *Polygala crotalarioides* Ham. and *Polygala arvensis* Willd. One species, *Polygala veneosus* Juss., of Java, called Kabututum, is said to be very poisonous. Several species are said to possess emetic properties, viz., *Polygala scoparia* Kth., of Mexico, and *Polygala angulata* D. C. (*P. Poaya* Mart.), of Brazil.

At the World's Fair in Chicago there was an exhibit of a large number of Brazilian drugs. Some of these were forwarded to the Philadelphia museums and others to Northwestern University. At the latter institution was a large bag labeled "RAIZ DE IPECACUANHA, ACARAHU, CEARA. ESILVAO LONSADA." An analysis of this root was made by J. B. Nagelvoort, and the results published in The Apothecary, June, 1896. My impression is that a note was published subsequently by Mr. Nagelvoort, reference to which I cannot at present ascertain.

Inasmuch as the origin of this root was not known, Prof. Oldberg asked me to look into the matter. The root in question had all the appearance, both macroscopic and microscopic, of a polygala, and upon submitting a sample to Dr. Theodor Peckolt, of Rio Janeiro, he pronounced it *Polygala angulata* D. C., and said that it is found in the States of Minas and St. Paulo, and is called "Poaya blanca, Weisse Ipecacuanha."

The commercial article consists of a root, about 7 to 20 centimeters in length, from which a few scattered rootlets project. The crown is surmounted by relatively numerous (as many as 8 or 10) fragments of the overground stems. The roots, as well as the overground stems, are of a light brown color.

The diameter of the root varies from 1 to 9 Mm. It is nearly cylindrical and without any keel. Some of the roots are more or less tortuous. The roots are longitudinally wrinkled, and are marked by numerous, rather transverse fissures. The relative thickness of bark compared to that of

wood is as follows: In young roots, 2 to 1; older roots, 1 to 2; and in the stem, 1 to 1.

The stems are comparatively uniform in size, and vary in length from

Polygala Angulata D. C. (A so-called Ipecac.)

20 to 40 Mm., the diameter being from 1 to 2 Mm. Some of the stems are also tortuous, wrinkled and fissured, somewhat resembling the roots in these respects.

The internal structure of both stem and root closely resembles that of the other polygalas that possess a concentric arrangement of the fibro-vascular tissues.

I desire to acknowledge my indebtedness to Dr. Charles Schaeffer, of the Academy of Natural Sciences of Philadelphia, for photographing the two specimens represented by the accompanying illustration.

The Chair stated that, without objection, the paper just read would be received, to take the usual course.

The next paper called for was one by Charles A. Walter, on "Proximate Analysis of Eupatorium Perfoliatum," which the Chair said was a very long one and not accompanied by an abstract. In the absence of the author it would therefore be read by title and referred. Said paper was as follows:

PROXIMATE ANALYSIS OF EUPATORIUM PERFOLIATUM.

BY CHARLES A. WALTER, INDIANAPOLIS, IND.

The Eupatorium Perfoliatum of the United States Pharmacopœia, belonging to the 17th class, first order Linnæus, is one of the most common of our indigenous syngenecious plants. It is found throughout almost the extent of our country, and is more generally diffused than any of its numerous congeners. Though not possessed of much external beauty to recommend it to the notice of the casual observer, yet the manner of its inflorescence and the connate or perfoliate character of its leaves, serve immediately to distinguish it.

In the fresh state the leaves, especially when rubbed between the fingers, have a peculiar, non-disagreeable odor, which is lost to a great extent in the process of desiccation. The flowers also when recent are agreeably aromatic, but in their dried condition they possess little or none of their peculiar aroma.

Though boneset, like too many of our indigenous remedies, is but seldom called into requisition by the medical practitioners for the cure of disease, yet its very general employment in domestic practice, and the reputation which it has acquired in many sections of the country, seem to warrant the assertion that it is deserving of more confidence than has hitherto been placed in its virtues.

The taste of eupatorium is peculiar, quite bitter, and somewhat persistent. It unites the properties of a tonic with those of a diaphoretic, expectorant and emetic, and it has also been supposed to contain something peculiar to itself, to which its tonic and emetic properties are due.

Experimental Part.

Proximate analysis of Eupatorium Perfoliatum.

For detailed methods see:

Prescott's Organic Analysis, p. 407–427.
Dragendorff's Plant Analysis, p. 5–99.
Von Mueller's Organic Constituents of Plants, p. 292–320.

1. *Preparation of the Sample.*

The dried specimen had been ordered finely ground and was received in the same shape. However, it was ground still more and as fine as possible in a mortar, and then placed in a clean dry quart jar and securely corked. This was the specimen used in the analysis.

2. *Estimation of Moisture.*

A sample of 3.0419 Gm., was dried for six hours at 100°–120° C., cooled in desiccator and weighed.

Loss in weight = .3013 Gm.
= 9.90 per cent. moisture.

3. *Estimation of Ash.*

A sample of 5.1033 Gm., was gently ignited until free from carbonaceous matter, care being taken not to allow the heat to rise above faint redness, as the chlorides, if present, might volatilize. The residue in dish, of .5225 Gm. was the crude ash.

(*a*) This residue was then treated with hot water, and the water-soluble part separated by filtering and evaporating the filtrate to dryness = .1725 Gm. or 30.014 per cent. This portion may contain chlorides, sulphates, phosphates and carbonates of potassium and sodium and slight amounts of chlorides of calcium and magnesium.

(*b*) The residue after extraction (*a*) was then treated with a slight excess of hydrochloric acid and evaporated in a porcelain dish over a water bath until all free acid had been expelled, 20 Cc. warm water added, and filtered from remaining particles. Filtrate evaporated to dryness and weighed. Wt. = .2881 Gm. or 55.138 per cent. This treatment removes carbonates and phosphates of calcium and magnesium, sulphates of calcium and oxides of iron and magnesium.

(*c*) The residue left after (*b*) was boiled with about 100 Cc. of 20 per cent. caustic soda solution for two hours. This treatment removes combined silica.

(*d*) This is removed from the insoluble matter, consisting of clay and sand brought in by the specimen. The residual matter after caustic soda treatment was filtered, washed, dried and weighed, = .0421 Gm.
= 8.057 per cent. insoluble matter.

(*e*) Difference between residue left after (*b*), and (*d*), equals the amount taken up by the caustic coda. = .0198 Gm. or 3.789 per cent.

Total Residue.	Water Soluble Part.	HCl Soluble Part.
.5225 Gm.	.1725 Gm.	.2881 Gm.

NaOH Soluble Part	Insoluble.
.0198 Gm.	.0421 Gm.

4. Estimation of Total Organic Nitrogen, Ammonium Salts and Nitrates.

(1) Total Organic Nitrogen and Ammonium Salts. (Wiley's Agric. Anal., Vol. 1.

Two Gm. of the powdered drug were washed with small portions of a two per cent. solution of tannin, using in all about 100 Cc. This dissolves out all nitrates and ammonium salts, while the tannin renders insoluble all the organic nitrogenous compounds. The filter and contents were then subjected to determination of total organic nitrogen by Kjeldahl method, and the ammonia liberated in distilling collected in 50 Cc. $\frac{N}{10}$ acid. After distillation was completed the acid was titrated back with $\frac{N}{10}$ caustic soda solution.

Cc. $\frac{N}{10}$ H_2SO_4 in receiver = 50 Cc.

Cc. $\frac{N}{10}$ alkali required to neutralize = 19 Cc.

Cc. $\frac{N}{10}$ acid neutralized by the ammonia = 31 Cc.

1 Cc. $\frac{N}{10}$ acid = .0014 Gm. nitrogen. 31 Cc. $\frac{N}{10}$ acid = .0434 Gm. N.

Then $\frac{.0434 \times 100}{2} = 2.17$ per cent. nitrogen

and $\frac{.0434 \times 6. \times 100}{2} = 13.02$ per cent. albuminoids.

After the ammonia from the total organic nitrogen determination had been completely driven over, the tannin solution containing the ammonium salts of the original plant was placed in the flask along with the previous contents and the whole subjected to distillation for free ammonia. Distillation continued until 250 Cc. distillate were collected and this was then nesslerized.

5 Cc. distillate was made up to 50 Cc. with ammonia-free water.

It required .85 Cc. ammonium chloride solution.

250 Cc. would then require 42.50 Cc. ammonium chloride solution, but 1 Cc. ammonium chloride = .01 m. g. ammonia.

Then 42.50 Cc. would be equivalent to .4250 m. g. ammonia, or .0004250 Gm. or practically no ammonium salts.

(2) Examination for nitrates.

Five Gm. of the powdered drug was extracted with 150 Cc. water, and extract then evaporated with five Cc. of caustic soda solution (20 per cent.), to about 50 Cc. This was then treated with aluminum foil and allowed to stand over night. The reduced solution was then diluted with ammonia-free water to 300 Cc., and solution was then subjected to distillation, and distillate collected and nesserlized.

250 Cc. distillate required 13.2 Cc. ammonium chloride giving .0085 Gm. nitrates in the five Gm. drug, or .0017 Gm. nitrates for 1 Gm. drug.

Other methods of estimating inorganic nitrogenous salts were tried.

Five Gm. of the drug were macerated with 200 Cc. ammonia-free water for 24 hours, then filtered and filtrate subjected to distillation. The organic nitrogen seemed to be given off upon boiling, as content of

ammonia increased instead of decreasing with each successive portion of the collected distillate. This method was then abandoned.

Then tried mixing the powdered drug with soda lye, and placing in a desiccator over 25 Cc. $\frac{N}{10}$ acid, and let stand closed for one week. By this process it was supposed that any ammonia present as ammonium salts, would have the ammonia liberated and it would be absorbed by the acid. After standing one week, the acid was removed and titrated back with alkali. No signs of any ammonia liberated by the plant.

5. *The Ligroin Extract.*

Set up a continuous extraction apparatus with a Soxhlet attachment and exhausted 20 Gm. of the powdered drug with 200 Cc. pure ligroin B. P. 40°–45° C. The operation carried on as long as anything was extracted, requiring some fourteen to sixteen hours. The greenish colored extract was poured off, and the drug washed with small amounts of ligroin to remove all extracted, and the two solutions united. The extract was then carefully evaporated in a shallow dish, in a large vacuum desiccator, so arranged that a current of dry air was drawn over its surface. (Prescott's Organic Analysis, p. 423.) The air was drawn through calcium chloride tubes, one being placed before and one after the desiccator, so that there could be no backward diffusion of air. The air was drawn through by suction pump, and the process continued until residue was dry. Dried further in vacuum over sulphuric acid and weighed. Wt. = .6142 Gm.

(*a*) Then treated residue with five Cc. of distilled water and evaporated and dried in air-bath at 110° C., cooled and weighed. Wt. = .6102 Gm. The loss in weight, or .0040 Gm. is due to volatile oil or other volatile substances.

(*b*) Then treated residue with 60 Cc. of hot water, stirring residue thoroughly, and let stand until perfectly cold. Then filtered by means of suction pump, separating residue from water-soluble extract. Then evaporated one-half of the liquid for total organic matter in solution, dried and weighed. Wt. = .0072 Gm.

.0072 Gm. × 2 = .0144 Gm. or total amount in whole extract ash = .0044 Gm.

The remaining half of the water extract was tested for alkaloids, glucosides, etc., but reagents showed their absence.

(*c*) The insoluble residue from (b) was removed from the filter by solution in ligroin, returned to former dish and evaporated; then treated with 25 Cc. of hydrochloric acid (1 per cent.) at 85° C., allowed to cool, filtered and evaporated. Wt. hydrochloric acid residue = .0158 Gm.

Then dissolved residue, and extracted with immiscible solvents, both in acid and alkaline solution. On evaporation of the extracts only slight deposits were obtained in each case, and these gave no alkaloidal or glucosidal reaction.

(*d*) The residue from (*c*) was then treated with three or four portions

of hot 80 per cent. alcohol, (using about 10 Cc. each time), allowing each portion to stand one hour. Filtered, evaporated and weighed. Wt. alcohol extract = .1094 Gm.

The deposit separated in light green globules and consisted of chlorophyll and resins.

(*e*) The part insoluble in the 80 per cent. alcohol, was dissolved in ligroin, evaporated and weighed. Wt. insoluble matter = .4658 Gm.

This consisted of wax and oils. The wax was found upon microscopical examination to be full of small acicular crystals, but these were far too small in quantity to be further separated.

6. *Extraction with Absolute Ether.*

That part of the material remaining after the extraction with ligroin, was treated with 200 Cc. of absolute ether. The process of continuous extraction was carried on in the same manner as in ligroin extraction, it requiring some twenty hours for complete process. The ether extract was then separated, drug washed with a few Cc. of ether, and united extracts placed in a shallow dish and evaporated in same manner as in 5. The extract was at last dried and weighed. Wt. ether extract = .8002 Gm.

Then determined the water-soluble part by adding 100 Cc. hot water, stirring, allowing to cool and filtering. Washed and dissolved residue on filter in ether, transferred to former dish, evaporated, dried and weighed. Wt. residue = .7016 Gm.

This residue consisted of resins and chlorophyll.

Some portions of the water solution were tested for benzoic, salicylic and oxalic acids, but none of these were found. Then extracted solution with immiscible solvents both in alkaline and acid solution. Slight deposits but no positive reactions.

7. *Extraction with Absolute Alcohol.*

After separation of the ether extract, the drug was extracted with 200 Cc. absolute alcohol. Process of extraction same as the others and the time required was some sixty hours to completely extract with alcohol. The extract was then poured off, drug washed and the united alcohol extracts brought to dryness by passage of dry air over the surface, same as in the others. Finally dried over sulphuric acid and weighed. Wt. total alcoholic extract = 7.2728 Gm.

200 Cc. hot water was then added and the residue thoroughly worked in it. After cooling it was filtered for the water-soluble part.

Then treated residue with a 1 per cent. solution of hydrochloric acid, cooled and filtered. Dried residue and weighed it, = (c). Evaporated acid solution to dryness and weighed it, = (b). Whole extract = A.

A = 7.2728 Gm. (b) = .0545 Gm. (c) = 1.7754 Gm.

A — c = amount soluble in water and the acid = B.

B — b = amount soluble in the water.

B = A — c = 5.4974 Gm.

B — b = amount soluble in water = 5.4974 — .0545 = 5.4429 Gm.

Then treated residue (c) with dilute ammonia, filtered, dried residue and weighed. Wt. residue = 1.0110 Gm.

Difference represents amount soluble in ammonia.

The water solution contained considerable tannin and some glucose, but no alkaloids.

The ammonia solution contained the acid resins. The insoluble part consisted of neutral resins.

8. *Water-Soluble Extract.*

The residual plant remaining after alcohol extraction was then treated with 200 Cc. hot water and allowed to macerate some seventy hours. Filtered, washed with hot water as long as filtrate was colored, keeping the wash-water separate, and made both solutions up to 150 Cc. Evaporated 25 Cc. of each solution to dryness, dried and weighed.

Wt. in original extract = 2.2250 Gm. in 250 Cc.

Wt. in wash-water = .8260 Gm. " " "

Or total water extract = 3.0510 Gm.

Ash = .4280 Gm.

Tests were then made on the solutions.

10 Cc. tested in both solutions for soluble starch, but found none present.

10 Cc. tested for tannic acid—heavy in both.

10 Cc. tested for gum—.0500 Gm. in total water extract.

10 Cc. tested for vegetable albumen—none present.

50 Cc. tested for sugar after removal of tannin, coloring matter, etc., by subacetate of lead and removal of excess of lead by hydrogen sulphide —no sugar present.

9. *Estimation of Alkali Extract.*

The residue after water extraction was next treated with about 200 Cc. of a .2 per cent. solution of caustic soda, and macerated some forty hours, and then heated on the water bath for six hours. Cooled, filtered washed the residue with water, dried and weighed. Difference between this weight and the one before alkali treatment gives amount dissolved by the caustic soda = 1.1502 Gm. This residue consisted of albumen and pectous substances.

10. *Estimation of Acid Extract.*

The drug after alkali extraction was macerated with 200 Cc. of a 1 per cent. solution of hydrochloric acid for 24 hours, and then heated on water bath for some six to eight hours. Filtered and made solution up to 500 Cc. Washed the residue well, dried and weighed. Wt. remaining drug = 4.3118 Gm. Wt. drug before acid treatment, 7.1118 Gm. Difference = 2.8000 Gm. extracted.

The greater part of this extract consisted of starch, determined by conversion into dextrose and subsequent reduction by Fehling's solution. The amount corresponds to 13.23 per cent of total plant.

11. *Lignin and Cellulose.*

Residue insoluble in dilute acid was macerated with 400 Cc. solution of chlorinated soda (Remington's Practice of Pharmacy, p. 495), and set away for 24 hours, then slightly acidified with hydrochloric acid and set away for another 24 hours. Then filtered, washed with hot water, and then with a .3 per cent. solution of caustic potash and lastly with pure water, dried and weighed the residue. Wt. residue = 3.2512 Gm.

Then ignited and determined the ash = .1502.

3.2512 — .1502 = 3.1010 Gm. cellulose = 15.50 per cent. cellulose.

4.3118 — 3.2512 = 1.1606 Gm. lignin = 5.80 per cent. lignin.

Bitter extractive.

Method—Dragendorff's Plant Analysis.

Von Mueller's Constituents of Plants.

One Gm. of the drug was heated with 100 Cc. water for one hour. Cooled, filtered and then extracted the filtrate with immiscible solvents for the bitter extraction.

Wt. bitter extractive = .1175 Gm.

= 11.75 per cent.

Total tannic acid.

One Gm. of the drug was macerated with 100 Cc. hot water and heated for one hour, cooled and filtered. This solution then contains tannic acid and albuminoids. Then precipitated the tannin by lead acetate solution, being careful not to precipitate the albuminoids. The precipitate was immediately collected on a filter, washed with water, dried and weighed = .1463 Gm.

Then removed the greater part of the precipitate from the filter paper, burnt filter with the addition of small amounts of ammonium nitrate. Then added remainder of the precipitate and incinerated to constant weight.

Wt. residue = .0950 Gm.

The difference equals tannic acid (Dragendorff's Analysis).

.1463 — .0950 = .0513 Gm.

= 5.13 per cent. tannic acid.

Summary of Analysis of Boneset.

Water	10.70 per cent.
Ash	9.90 "
Albuminoids	13.02 "
Tannic acid	5.13 "
Wax, crystalline	2.32 "
Cellulose	15.50 "
Lignin	5.80 "
Starch and isomers	13.23 "
Resins and chlorophyll	12.38 "
Gum	.25 "
Bitter extractive	11.75 "
	99.98 per cent.

Analysis in detail of 20 Gm. of Eupatorium Perfoliatum.

(*A*) Extracted by Ligroin .6102 Gm.

(1) Soluble in water = .0144 Gm.

(*a*) Extracted by ether in alkaline solution .0018 Gm.

(*b*) Extracted by ether in acid solution .0026 Gm.

(2) Hydrochloric acid soluble part = .0158 Gm.

(*a*) Extracted by ether in alkaline solution .0016 Gm.

(*b*) Extracted by ether in acid solution .0026 Gm.

(3) Soluble in alcohol = .0198 Gm.

Deposit consisted of resins and chlorophyll.

(4) Insoluble residue = .4658 Gm.

Deposit consisted of wax and oils.

(*B*) Extracted by absolute ether .8002 Gm.

(1) Water soluble part = .0986 Gm.

(*a*) Extracted by ligroin in acid solution .0045 Gm.

(*b*) Extracted by chloroform in acid solution .0265 Gm.

(*c*) Extracted by ligroin in alkaline solution .0015 Gm.

(*d*) Extracted by chloroform in alkaline solution .0029 Gm.

(2) Insoluble residue = .7016 Gm.

Deposit consisted of resins and chlorophyll.

(*C*) Extracted by absolute alcohol 7.2728 Gm.

(1) Water soluble part 5.4429 Gm. Dissolved in water and after removal of tannins, etc., treated with immiscible solvents.

(*a*) Extracted by ligroin in acid solution .0080 Gm.

(*b*) Extracted by chloroform in acid solution .0250 Gm.

(*c*) Extracted by ligroin in alkaline solution .0020 Gm.

(*d*) Extracted by chloroform in alkaline solution .0090 Gm.

(2) Hydrochloric acid soluble portion = .0545 Gm.

(3) Ammonia extract = .7644 Gm.

Residue consisted of resins.

(4) Insoluble part = 1.0110 Gm.

Residue consisted of resins and chlorophyll, or any albuminoids present.

(*D*) Extracted by Water 3.0510 Gm.

The residue consisted of gum, albuminoids, ammonium salts and tannin.

(*E*) Extracted in Alkaline Solution 1.1502 Gm.

Consisted of pectin and albuminous substances.

(*F*) Extracted in Acid Solution 2.8000 Gm.

Consisted of starch and isomers.

(*G*) Cellulose and Lignin.

Wt. residue after acid extraction 4.3118 Gm.

Treatment with chlorinated soda solution.

Wt. Cellulose 3.1010 Gm.

Lignin by difference = 1.1606 Gm.

Charles H. Shamel, in his thesis for M. S. degree in 1891, separated what he thought was the medicinal principle of boneset. I, therefore, extracted three pounds of the drug in a percolator in exactly the same way as he did, in order to study the medicinal principle more closely.

Three pounds of the powdered drug was moistened with alcohol, and then packed in a percolator and extracted continuously with alcohol until the percolate came through colorless, and left no residue upon evaporation. Then distilled off the greater part of the alcohol, and upon cooling of the residue in the flask, an oily, afterwards semi-solid black mass separated. This was filtered off and the filtrate evaporated still more. A similar substance separated upon continued evaporation. After filtering off this insoluble matter, poured the filtrate, of about 200 Cc. bulk, into 400 Cc. water slightly acidified with hydrochloric acid. A similar substance as those previous insoluble residues, separated. These three residues consisted of resin, separating out as solution loses alcohol and becomes more aqueous. The reddish colored liquid was then filtered from small suspended particles of resin. This filtrate was then extracted, both in acid and alkaline solution, with ether. The reddish brown amorphous deposits resulting are what Shamel called the medicinal principle, and the substance which he treated with nitric acid. On treating these residues with fuming nitric acid, strong action took place attended by effervescence, and resulting in complete solution of the material. The reddish-brown solution was brought down to dryness by spontaneous evaporation in vacuum desiccator over lime.

When nearing dryness some crystals separated from the mass, but it was brought to complete dryness. The crystals were removed from the vacuum and found to be prismatic, some ¼ inch in length, opaque and intermixed with a little yellowish red gummy substance.

The deposit was treated with hot water and the crystals easily dissolved, while the other part did not. This gummy matter was then dissolved in alcohol, and both solutions brought down to crystallization point and let stand. The aqueous solution deposited fine crystals, but none separated from the alcoholic solution. The crystals from aqueous liquid were recrystallized, and subsequently tested. This is what Shamel said was the nitrate of the medicinal principle of the formula $C_{20}H_{25}O_{16}HNO_3$. An aqueous solution gives the tests he mentioned.

Upon examination of the crystals, they resembled very closely those of oxalic acid. So they were carefully examined: dissolved easily in water, precipitated by barium chloride or calcium chloride. These precipitates dissolve easily in hydrochloric acid and are reprecipitated by ammonia. When examined they are found to consist of prismatic crystals containing water of crystallization, and when placed in dry air or vacuum, they lose their water and become opaque. They again become clear upon exposure to moist air. The melting point was 100°–102° C. The reactions through-

out are identical with those of oxalic acid. A determination for nitrogen showed none present in the crystals examined, which according to Shamel's formula, contains it.

Furthermore, tannic acid when treated with nitric acid decomposes, with the formation of oxalic acid. (Trimble's book on Tannins.) The residue Shamel treated was the tannin from the plant, and thus by treating it with fuming nitric acid, he obtained simply oxalic acid instead of the medicinal principle $C_{20}H_{25}O_{36}.HNO_3$, and his nitrogen determination must have been at fault.

As all the tannin residues had been treated with the nitric acid, another large amount of the drug had to be extracted.

Four pounds of the drug were moistened with alcohol and packed in a percolator fitted with a steam jacket, and the drug extracted continuously by hot alcohol. The alcohol was distilled from the extract, and after removal of the separating resin, was poured again into water, and treated as before. That is, removed the resin and then extracted in acid and alkaline solution with ether. The acid extracts were quite large, but very little in alkaline solution deposits. The acid extract was then dissolved in dilute alcohol and consisted of tannin, bitter extractive, coloring matters and some albuminoids. The alcoholic solution was then treated with solution of sub-acetate of lead, as long as anything was precipitated. Filtered, washed precipitate with water, and then decomposed it while suspended in water, by hydrogen sulphide, filtering and evaporating solution to dryness. The filtrate from lead acetate precipitation was treated with hydrogen sulphide to remove excess of lead, filtered, and evaporated to dryness. Both reddish brown deposits—amorphous.

The residue from filtrate after the sub-acetate precipitation was further purified by solution and re-extraction. Finding the bitter principle to be soluble in chloroform, treated deposit with chloroform, and evaporated the chloroform extract to dryness. The residue was light reddish brown, transparent and extremely bitter, the taste remaining for a long time. This was the purified bitter principle, and after thorough drying in vacuum over sulphuric acid, an ultimate analysis was made.

COMBUSTION OF THE BITTER PRINCIPLE.

1. *Determination of Carbon and Hydrogen.*

(1) .1336 gm. substance gave .3144 gm. CO_2 and .1095 gm. H_2O. which equals 64.18 per cent. carbon and 9.10 per cent. hydrogen.

(2) .1692 gm. substance gave .3986 gm. CO_2 and .1354 gm. H_2O, which equals 64.25 per cent. carbon and 8.89 per cent. hydrogen.

2. *Determination of Nitrogen.*

(1) .1666 gm. substance gave 3.2 Cc. nitrogen.
Temperature = 23° C.
Barometric reading 731.7 mm.

Then

$$\text{Per cent. N} = \frac{V.}{273+t}\cdot\frac{273}{}\cdot\frac{b-w}{760}\cdot .001256\cdot\frac{100}{g}$$

$$= 3.2\cdot\frac{273}{296}\cdot\frac{731.7}{760}\cdot .001256\cdot\frac{100}{.1666}$$

$$= 2.14 \text{ per cent. nitrogen.}$$

(2) .2333 gm. substance gave 4.7 Cc. nitrogen.

Temper ture = 23° C.

Barometric reading 737.8 mm.

Then

$$\text{Per cent. N} = 4.7\cdot\frac{273}{296}\cdot\frac{737.8}{760}\cdot .001256\cdot\frac{100}{.2333}$$

$$= 2.21 \text{ per cent. nitrogen.}$$

C = 64.18 ÷ 12 = 5.348 = 35 35

H = 8.89 ÷ 1 = 8.89 = 58.1 58

N = 2.14 ÷ 14 = .1528 = 1 1

O = 24.79 ÷ 16 = 1.540 = 10 10

Calculated composition to $C_{35}H_{58}NO_{10}$

which requires:

	Found.
C. = 64.41	C. = 64.18
H. = 8.83	H. = 8.89
N. = 2.13	N. = 2.14
O. = 24.63	O. = 24.74

The other residue was far from pure, as it consisted of coloring matter, tannin, and albuminoids, all precipitated by subacetate of lead solution. Then separated the albuminoids by fractional precipitation, but could not separate the coloring matter and tannin satisfactorily. Tested the nature of the residue as regards decomposition with acid. It yielded a reddish-brown substance when boiled with dilute acid, and glucose, identified by the hydrazine reaction.

As this was unsatisfactory, I set it aside and extracted two pounds more of the drug. Extracted with 95 per cent. alcohol, and then with 50 per cent. and united the two extracts. Distilled off the alcohol until after the separation of the resin. Then extracted the solution with ether to remove chlorophyll and wax. The reddish-brown solution after extraction with ether was then fractionally precipitated by subacetate of lead solution. A trial showed that nearly all the tannin could be precipitated before the whitish precipitate of albuminoids began to separate. The tannin was therefore precipitated, filtered off, washed, and then decomposed while suspended in alcohol, by hydrogen sulphide, as an alcoholic solution is more stable than the aqueous solution. Filtered off the lead sulphide from the reddish-yellow solution. The filtrate from the subacetate precipitation was treated with hydrogen sulphide, to remove excess of lead, fil-

tered, and the solution evaporated. Deep reddish colored solution. Analysis of it showed small amount of tannin, albuminoids, gum, bitter extractive, and a small amount of glucose, due to decomposition of the glucosides.

The alcoholic solution now contains the coloring principle, and the tannin itself. Their general reactions were the same, only the coloring matter separated when a greater part of the alcohol was evaporated and the solution became more aqueous.

Therefore I subjected the alcoholic solution to distillation under reduced pressure. When nearly three-fourths of the alcohol had distilled over, a yellowish flaky substance began to separate and more was deposited on cooling. Filtered off this deposit, marked A., and subjected filtrate still further to distillation, and again more separated, and continuing this method, all of the yellowish deposit was collected. Then distilled the aqueous solution down to syrupy consistency at pressure of 300 mm., and then brought to dryness in a vacuum desiccator over sulphuric acid. The deposit consisted of a reddish-brown glassy mass, transparent, and easily absorbing moisture from the air.

Then turned attention to this yellowish deposit, marked A. It was washed with chloroform and ether until washings were clear. It was then purified by two crystallizations from dilute alcohol, and then a subsequent crystallization from very dilute alcohol. The crystals separated as pale yellow needles. An alcoholic solution gives the following reactions:

Ferric Chloride — dark green color.

Subacetate of Lead — orange yellow precipitate.

Dilute Alkalies — bright yellowish color.

The crystals were then dried at 110° — 115° C., and their reactions and composition studied as well as possible with the amount of material obtained; 2 lbs. of drug yielding 1.3860 Gm. substance.

1. Combustion Shows:

(1) .1276 gm. substance gave .2422 gm. CO_2, and .0543 gm. H_2O., which gives C = 51.76 per cent., and H = 4.73 per cent.

(2) .1052 gm. substance gave .1998 gm. CO_2, and .0453 gm. H_2O., which gives = 51.79 per cent. and H = 4.78 per cent.

Calculated composition to $C_{27}H_{30}O_{17}$

which requires C = 51.76 per cent. and H = 4.79 per cent.

2. Fusion with Alkali.

The yellow deposit was next fused with caustic soda to study its decomposition products, using the ratio of substance to alkali 1 : 6. Heated until thoroughly fused and kept fused fifteen to twenty minutes. Allowed to cool, dissolved in smallest amount of water, acidified with sulphuric acid, filtered, and extracted with ether. The deposit was not obtained in satisfactory crystalline form, so it was dissolved in water and solution

treated with lead acetate, to precipitate any protocatechuic acid, filtered, removed excess of lead by hydrogen sulphide, and after boiling off vapors of hydrogen sulphide, tested for phloroglucin in filtrate by color reactions. Examination showed both phloroglucin and protocatechuic acid present.

3. Decomposition with Acid.

Trial experiment showed the yellow deposit to be a glucoside, so treated the remainder of the deposit with 500 Cc. of 3 per cent. sulphuric acid, and heated on water bath for four hours. At this time a yellow crystalline product began to separate, so removed it from the bath and allowed to stand over night. Filtered off the deposit and evaporated the filtrate down to small bulk. Some more of the yellow substance separated; again cooled and filtered, and the joint yellowish deposit washed thoroughly. The united filtrates were then set away for further examination. The yellowish deposit was dried and gave a yield of .2850 Gm. It consisted of small yellow needles, slightly soluble in cold alcohol, somewhat readily in hot alcohol.

An alcoholic solution gives with:

Ferric Chloride—dark green solution.

Lead Acetate Solution—orange red precipitate.

Subacetate of lead solution—orange red precipitate.

Combustion of the substance shows:

(1) .1162 Gm. substance gave .2540 Gm. CO_2 and .0350 Gm. H_2O, which equals 59.61 per cent. carbon and 3.34 per cent. hydrogen.

(2) .1078 Gm. substance gave .2358 Gm. CO_2 and .0323 Gm. H_2O, which equals 59.61 per cent. carbon and 3.27 per cent. hydrogen.

Calculated from these percentages the composition $C_{15}H_{10}O_7$ which requires:

	Found.
C. = 59.60 per cent.	C. = 59.61 per cent.
H. = 3.31 per cent.	H. = 3.34 per cent.
O. = 37.09 per cent.	O. = 37.05 per cent.

The filtrate from the yellow deposit was neutralized with barium carbonate, the precipitate filtered off and the solution evaporated part way and again filtered. Then treated the solution with phenyl-hydrazine in presence of acetic acid, heated for two hours on the water bath, cooled, filtered off the yellow deposit and washed. Then purified by recrystallization. The crystals melted at 204°–205° C. Hence, our coloring matter was a glucosidal tannin, the reaction taking place is probably $C_{27}H_{30}O_{17} + 2H_2O = C_{15}H_{10}O_7 + 2C_6H_{12}O_6$.

Having finished the examination of the coloring principle then turned attention to the other tannin. It is easily soluble in hot water and alcohol, gives deep green color with ferric chloride, a yellow precipitate with lead acetate solution and an orange red precipitate with subacetate of lead solution; dissolves completely in dilute alkalies with production of lemon

yellow color, which upon being exposed to the light and air takes on a blood-red tint, also becomes darker on heating on water bath.

It is precipitated from concentrared solutions by saturated solutions of potassium chloride, potassium acetate, sodium chloride, calcium and ammonium chlorides. The mineral acids exert some power of precipitation, except nitric acid which decomposes it immediately if fuming acid is added, slower if concentrated acid is used, and with the production of a deep reddish-brown colored solution.

Combustion of the substance shows :

(1) .1312 Gm. substance gave .2487 Gm. CO_2 and .0812 Gm. H_2O, which equals 51.98 per cent. carbon and 6.88 per cent. hydrogen.

(2) .1162 Gm. substance gave .2202 Gm. CO_2 and .0718 Gm. H_2O, which equals 51.69 per cent. carbon and 6.66 per cent. hydrogen.

Calculated formula from these percentages and find that percentages fit equally well two formulæ, $C_{10}H_{16}O_6$ and $C_{12}H_{18}O_7$.

$C_{10}H_{16}O_6$ requires,	$C_{12}H_{18}O_7$ requires,	Found.
51.73 per cent. carbon	52.70 per cent. carbon	51.98 per cent. C.
6.84 per cent. hydrogen	6.60 per cent. hydrogen	6.64 per cent. H.
41.43 per cent. oxygen.	40.70 per cent. oxygen.	41.38 per cent. O.

1. *Action of Heated Glycerin.*

Two Gm. of the tannic acid was heated in a porcelain crucible at 195°–200° C. with 6 Cc. glycerin for one-half hour. The substance became liquid of deep reddish-brown color. Then dissolved the contents of the crucible in 50 Cc. water, and the liquid was extracted with ether.

The yellowish deposit resulting from evaporation of the ether extract was then dissolved in water and examined as follows :

Ferric chloride—green-colored solution, and after the addition of small amount of sodium carbonate, the liquid turned blue and then a deep crimson red.

Ferrous salts—deep violet color.

Precipitated by subacetate of lead, and after removal of the precipitate, and the excess of lead by hydrogen sulphide. solution gave no tests for phloroglucin. Hence, protocatechuic acid alone resulted from the fusion with glycerin.

2. *Fusion with Alkali.*

Fusion with alkali was carried out in exactly the same manner as with the coloring principles (before described), and hence needs no further explanation here. Protocatechuic acid and phloroglucin both resulted from the decomposition.

3. *Glucosidal Nature of the Tannin.*

The tannin was boiled with dilute sulphuric acid for four hours. A reddish-brown deposit separated, and after filtering, the filtrate was tested

for glucose or dextrose by phenyl-hydrazine reaction. Dextrose was present.

The reddish-brown substance was well washed, dried and analyzed.

Combustion shows:

(1) .1036 Gm. substance gave .2099 Gm. CO_2 and .0723 Gm. H_2O, which equals 55.29 per cent. carbon and 7.75 per cent. hydrogen.

(2) .0984 Gm. substance gave .2013 Gm. CO_2 and .0686 Gm. H_2O, which equals 55.79 per cent. carbon, and 7.74 per cent. hydrogen.

(3) .1312 Gm. substance gave .2660 Gm. CO_2, and .0903 Gm. H_2O which equals 55.27 per cent. carbon, and 7.64 per cent. hydrogen.

Calculating the formula from these percentages gives $C_6H_{10}O_3$.

$C_6H_{10}O_3$ requires	Found.
Carbon, 55.29 per cent.	55.36 per cent. carbon.
Hydrogen, 7.69 per cent.	7.64 per cent. hydrogen.
Oxygen, 37.02 per cent.	37.10 per cent. oxygen.

As this is the product obtained by hydrolysis from the tannin, the reaction is probably

$$C_{12}H_{18}O_7 + 2H_2O = C_6H_{12}O_6 + C_6H_{10}O_3.$$

Since it is quite unlikely that a dextrose and a body having the formula $C_6H_{10}O_3$ could result from hydrolysis of a substance corresponding to the formula $C_{10}H_{16}O_6$, it would seem that the formula for the tannin is $C_{12}H_{18}O_7$ and not $C_{10}H_{16}O_6$.

4. *Acetyl Derivative.*

Three grammes of the tannic acid were boiled with 10 Cc. of acetyl chloride for about one hour, under a reflux condenser. Then an equal volume of glacial acetic acid was added, stirred, and the reddish brown solution poured slowly into ice-cold water, stirring vigorously all the time. The acetyl compound separated as a voluminous grayish white precipitate. This was rapidly filtered off by means of suction pump, well washed with cold water, pressed between filtered paper and finally dried in vacuum over sulphuric acid; yield 1.1376 Gm.

The compound was grayish white in color, tasteless, soluble in alcohol, chloroform and glacial acetic acid, slightly soluble in dilute alkalies and acids, in ether, and insoluble in water and ligroine.

For the determination of the number of acetyl groups in the new compound I proceeded as follows:

.5 gm. of the substance was boiled with 50 Cc. of 6 per cent. sulphuric acid for one to two hours in a 250 Cc. flask under reflux condenser, and the process continued until action seemed complete, which could be told by solution of all substances, becoming a reddish colored solution. Allowed to cool, added 150 Cc. warm distilled water and whole removed to distilling flask, and the former flask well washed and the washings added to the contents of the distilling flask. The liquid was then distilled and

the distillate collected in standard alkali. The distillation was carried on until contents of flask were reduced to about 75–100 Cc., when fresh warm water was added and the distillation recommenced. Saturation of contents of the flask must be avoided, as sulphuric acid is, in that case, apt to be carried over.

The process of distillation was carried on until the distillate showed no acid reaction. The alkali solution was then titrated back with standard acid, using phenyl-phthalein as indicator. The acetic acid formed from .5 Gm. of the acetyl compound amounted to .3380 Gm. or 67.80 per cent.

Combustion of the Acetyl Compound proper shows:

(1) .1065 Gm. substance gave .2127 gm. CO_2 and .0562 Gm. H_2O, which equals 54.47 per cent. carbon and 5.87 per cent. hydrogen.

(2) .1018 Gm. substance gave .2031 Gm. CO_2 and .0540 Gm. H_2O, which equals 54.43 per cent. carbon and 5.89 per cent. hydrogen.

This again can fit either one of the two formulæ, $C_{22}H_{28}O_{12}$ or $C_{20}H_{26}O_{11}$.

$C_{20}H_{26}O_{11}$ requires	$C_{22}H_{28}O_{12}$ requires	Found.
C. = 54.29 per cent.	C. = 54.54 per cent.	C. = 54.47 per cent.
H. = 5.88 per cent.	H. = 5.80 per cent.	H. = 5.87 per cent.
O. = 39.83 per cent.	O. = 39.66 per cent.	O. = 39.66 per cent.

Taking 67.80 per cent. of the molecular weight of these compounds we get:

$C_{22}H_{28}O_{12}$ gives 326 ÷ 60 (mol. wt. acetic acid) = 5 mol.

$C_{20}H_{26}O_{11}$ gives 294 ÷ 60 (mol. wt. acetic acid) = 5 mol.

Calculating then five molecules of acetic acid in each of the above, replacing five hydroxyl groups, gives $C_{12}H_{13}O_7(C_2H_3O)_5$ and $C_{10}H_{11}O_6(C_2H_3O)_5$.

5. Tribrom Derivative.

An aqueous solution of the tannin was treated with a fresh solution of bromine water, as long as a precipitate was formed. The precipitate at first was quite dark, but became lighter in color toward the end of the precipitation. Filtered off the product and washed with water until free from bromine and hydrobromic acid, which could easily be told by treating the filtrate with a drop of silver nitrate solution. The precipitate was dried on a clean porous plate, and then in vacuum over sulphuric acid. The substance became darker in color during process of drying. The dry product was then analyzed for bromine content.

Two samples were accurately weighed in small tubes, the whole placed in two Carius tubes with about .5 Gm. silver nitrate and 2 Cc. of fuming nitric acid and the tubes then sealed. Heated then in halogen combustion furnace as follows:

1–2 hrs. 100° C.

2–4 hrs. 150° C.

4–6 hrs. 200° C.
6–8 hrs. 250° C.

The tubes were allowed to cool and then opened and contents washed into beakers with hot water, being sure to remove all precipitate from combustion tubes. Then heated the beakers and contents on the water bath for ½ hour, filtered and the silver bromide weighed and the bromine calculated.

(1) .0746 Gm. substance gave .0822 Gm. silver bromide, which equals 46.87 per cent. bromine.

(2) .1014 Gm. substance gave .1118 Gm. silver bromide, which equals 46.91 per cent. bromine.

Assuming that the formula of the tannin is $C_{12}H_{18}O_7$, this percentage of bromine corresponds to the tri-brom. derivative $C_{12}H_{15}Br_3O_7$, the theoretical percentage being 46.90 per cent. bromine.

The important constituents of the plant are then (1) a coloring principle of the formula $C_{27}H_{30}O_{17}$, (2) the plant tannin of formula $C_{12}H_{18}O_7$, and the bitter principle $C_{35}H_{58}NO_{10}$.

The paper next called for was one entitled "What Representative Pharmacists and Physicians Think About Plasters," by Seward W. Williams, and Mr. Williams presented the paper in abstract.

WHAT REPRESENTATIVE PHARMACISTS AND PHYSICIANS THINK ABOUT PLASTERS.

BY SEWARD W. WILLIAMS.

Query Number 3—"*To what extent are official plasters employed in the practice of pharmacy and medicine*"—constitutes a very natural question on the eve of pharmacopœial revision. Before a decision can well be reached as to what plasters shall be retained, dismissed or introduced, it is certainly desirable to know whether or not those at present official are employed. If present pharmacopœial plaster formulas are practically unused, it seems equally important to inquire as to the merits of the articles which are employed in place of them. We are interested in knowing the attitude toward plasters of both pharmacists and physicians, and must not overlook the feeling of the people, whose interests both professions seek to serve.

At the last meeting of this Association, a prominent member from Chicago took the initiative in comparing the respective merits of the official and the rubber-combination plaster masses, claiming the former to be superior, especially from the standpoint of absorbability.

Believing that a proper way to arrive at a fair understanding of our subject would be to secure opinions of representative physicians and pharmacists in all sections of the country, the writer undertook to poll the American Medical Association and the American Pharmaceutical Association with a view to securing an expression of opinion from each State, and, thanks to the kind co-operation of a large proportion of the physicians and

pharmacists addressed, he is enabled to give what seems to be a fair idea of the attitude of the two professions in the United States toward plasters.

To render a satisfactory classification of replies practicable and as brief as possible, seven questions, bearing upon the most salient points of our subject, were addressed to representative members of each Association in each State. Following is the result:

Views of Representative Members of the A. Ph. A.

1. *About how often do you prepare or dispense a plaster strictly in accord with the U. S. Pharmacopœia, using the official lead plaster, resin, soap or pitch combination mass?*

District of Columbia (*Washington*).—G. G. C. Simms: Not one during the last five years, I should say.—Wm. S. Thompson: Once in sixty days.—F. M. Criswell: About once a year, probably less.—Wm. C. Field: Not more than half a dozen times a year.—Geo. W. Boyd: Have not prepared a plaster for several years, except cantharides.

Alabama.—J. J. Barnet, Montgomery: Have never prepared any except at college.—G. A. Knabe, Montgomery: About one in ten years.—P. C. Candidus, Mobile: Hardly ever.

Arkansas.—Wm. W. Kerr and John Wade Fletcher, Batesville: Never.—Dr. John B. Bond, Little Rock: Never! It is a lost art in this section, and properly.—E. F. Klein, Hot Springs: Made none for several years.—John A. Junkind, Little Rock: Hardly ever.

Arizona.—Harry Brisley, Prescott: Once in six months perhaps.

California.—Prof. Wm. M. Searby, San Francisco: Scarcely ever; perhaps once a year, except as mentioned in answer to number 2.—John H. Dawson, San Francisco: Not any; no demand whatever.—James G. Steele, San Francisco: Seldom.

Colorado.—Charles M. Ford, Denver: "Hardly ever" (Pinafore).—A. Jae Ward, Colorado Springs: Made but one in past ten years.—C. H. Wells, Pueblo: Never.

Connecticut.—Charles A. Rapelye, Hartford: Rarely, if ever, except occasionally Emp. Canth.—J. K. Williams, Hartford: Almost never. Don't think I've prepared one in five years.—R. H. Dimock, New Haven: Very seldom.—W. A. Spalding, New Haven: About one plaster in each month.—A. F. Wood, Jr., New Haven: Perhaps about twenty plasters a year. This includes some sixteen plasters for one physician.—E. A. Gessner, New Haven: Not to exceed a dozen times a year.

Delaware.—E. S. Collins, Wilmington: Seldom.

Florida.—Dr. J. D. Crum, Jacksonville: I have not once in ten years.—W. J. Woodman, St. Augustine: Only a few times a year.—L. S. Smith, St. Augustine: Two or three times only a year.

Georgia.—Jos. Jacobs, Atlanta and Birmingham: Less than twenty times.—R. H. Land, Augusta: Never.—H. J. Lamar, Macon: Very seldom indeed.

Idaho.—D. E. Smithson, Caldwell: Never.

Illinois.—Albert E. Ebert, Chicago: None within a year.—M. N. Porter, Chicago: Very seldom.—N. Gray Bartlett, Chicago: About once a year.—W. M. Benton, Peoria: Since 1882 I do not remember a call for an official plaster to be prepared, in more than 100,000 prescriptions.—G. W. Sohrleck, Moline: None for several years.—Dr. J. A. Koch, Quincy: Emp. Canth. U. S. P. is the only plaster I ever prepared, and is superior to the manufactured.

Indian Territory.—G. A. Hillebert, Wynnewood: Have never done so.—C. G. Moore, Eufaula: Very rarely.—Dr. Fred. S. Clinton, Tulsa: Never when it can be avoided.

INDIANA.—Dr. Geo. W. Sloan, Indianapolis: Practically never.—Dr. J. N. Hurty, Indianapolis: Never. At least not for five years.—R. I. Eads, Indianapolis: Not to exceed twelve times per annum, I think.—Charles A. Walter, Indianapolis: Rarely.—Leo Eliel, South Bend: Very seldom.

IOWA.—J. W. Wittmer, Dubuque: Once a year.—Fletcher Howard, Des Moines: Very rarely.

KANSAS.—H. W. Mehl, Leavenworth: Have not for over three years.—George Leis, Lawrence: Entirely out of date; no more prescriptions for official plasters.—John T. Moore, Lawrence: As store-spread plasters, not twice a year; as plaster masses, about once a month.

KENTUCKY.—Simon N. Jones, Louisville: Have not had a prescription for one for ten years.—W. H. Averill, Frankfort: Have not once in the past five years.—J. F. Belt, Covington: Not in the three and a third years I have been in business here.—Wm. Votteler, Louisville: Use lead plaster in *ointments* for combination frequently; spread plasters, have dispensed about ten in ten years.

LOUISIANA.—I. L. Lyons, New Orleans: Always prepare a plaster unless physician orders proprietary.—F. C. Godbold, New Orleans: Very seldom.

MAINE.—Charles K. Partridge, Augusta: Not often now: formerly much. Physicians here generally order standard manufacturers' spread. Public buy the same.—William A. Robinson, Auburn: In these days very rarely, perhaps once a month, if so often.—Caldwell Sweet, Bangor: Seldom.—N. S. Harlow, Bangor: Perhaps once in three years.—James A. Broe, Portland: Very seldom.—A. G. Schlotterbeck, Portland: Hardly ever.

MARYLAND.—Henry P. Hynson, Baltimore: Once or twice a month.—J. H. Baughman, Baltimore: Do not average one a year.—H. A. Elliott, Baltimore: Not once a year.

MASSACHUSETTS.—S. A. D. Sheppard, Boston: Once or twice a year.—Geo. F. Scott, Worcester: About one dozen a year.—Charles H. Price, Salem: Very seldom.

MICHIGAN.—F. W. R. Perry, Detroit: Once in past four years.—George McDonald, Kalamazoo: Rarely ever.

MINNESOTA.—S. F. Boyce, Duluth: None.—Miss J. A. Wanous, Minneapolis: I have not had occasion in ten years' experience to make U. S. P. plasters.—Charles H. Huhn, Minneapolis: Very, very seldom.

MISSISSIPPI.—John A. Shreve, Port Gibson: Have *no* call for them. Physicians here do not use any.—J. F. Moore, Meridian: Have been a pharmacist since 1886, and have never prepared a single plaster: always buy them.

MISSOURI.—William Mittelbach, Boonville: Haven't spread a plaster for ten years.—Adolph Brandenberger, Jefferson City: Never.—O. W. Krueger, Kansas City: Four last year (lead and pitch).

MONTANA.—Emil A. Starz, Helena: About four times during ten years.

NEBRASKA.—N. A. Kuhn, Omaha: None in past three years.—P. B. Myers, Omaha: None.—J. H. Schmidt, Omaha: Very seldom: not once a year.—A. V. Pease, Fairbury: Never.

NEVADA.—W. A. Brown, Winnemucca: Rarely: probably once in two years.

NEW HAMPSHIRE.—Wm. D. Grace, Portsmouth: Never.—A. P. Preston, Portsmouth: Very rarely.—N. S. Whitman, Nashua: Perhaps one in five years.

NEW JERSEY.—Eugene Hartnett, Jersey City: Never, within five years.—Charles Holzhauer, Newark: Not any in five years, and not more than twenty in thirty eight years, and none on the prescription of a physician.—D. L. Cameron, Rutherford: Not once in twelve months.—G. W. Parisen, Perth Amboy: Very seldom.

NEW YORK.—F. H. Bradley, Albany: Not over five or six times a year.—C. H. Gaus, Albany: About once in three months.—Dr. W. G. Gregory, Buffalo: About never.

—T. D. McElhenie, Brooklyn: So rarely that I cannot remember when.—Wm. H. Rogers, Middletown: Never.—C. H. Butler, Oswego: Practically never.—W. A. Smith, Richfield Springs: Perhaps not more than ten or twelve times during a year.—E. S. Dawson, Syracuse: Perhaps decennially.—C. W. Holmes, Elmira: None.—Dr. Henry Schmid, New York: So seldom that I don't remember.—Dr. W. C. Alpers, New York: Whenever a physician orders one, about once a month.—Wm. Hauenstein, New York: Very seldom.—Charles S. Erb, New York: Very seldom.—E. L. Milhau, New York: We spread (on sheep skin) about as many in a year as we sometimes did in a week.

North Carolina.—W. G. Smith, Asheville: Have not prepared a plaster for the last ten years.—William Simpson, Raleigh: About once in ten years.—H. T. Hicks, Raleigh: oo.

North Dakota.—Herbert E. White, Jamestown: None whatever.—Lars Christianson, Fargo: Once or twice a year.—J. W. Sullivan, Valley City: During my ten years' experience, have not had a prescription for an official plaster.

Ohio.—G. W. Voss, Cleveland: Six to eight a year.—George L. Hechler, Cleveland: Once or twice a year.—Joseph H. Johnson, Arcanum: Never.

Oregon.—E. A. Sherwin, Ashland: Very seldom.

Pennsylvania.—J. B. Moore, Philadelphia: Very seldom; not a dozen a year.—Gustavus Pile, Philadelphia: I am now out of the retail business, and so do not have occasion to spread plasters. I'm not sorry.—Jesse B. Duble, Williamsport: Very rarely.—S. W. Heinitsh, Lancaster: A very rare occurrence in the past few years.—J. H. Redsecker, Lebanon: Not once in six months.—Jos. L. Lemberger, Lebanon: Very rarely.—G. W. Kennedy, Pottsville: Average about one a month.—John F. Patton, York: We have not been called upon to spread a plaster on the prescription of a physician for ten years.—Dr. J. A. Miller, Harrisburg: Do not prepare any.—Dr. Louis Emanuel, Pittsburgh: Not at all.—Wallace Procter, Philadelphia: Eight or ten times a year on an average.

South Carolina.—Henry C. Plenge, Charleston: Not once a year.—Oscar E. Thomas, Columbia: Not more than two or three times a year.

South Dakota.—L. T. Dunning, Sioux Falls: None.—F. A. Brecht, Yankton: Not for years.—David F. Jones, Watertown: Not at all.

Tennessee.—F. H. Peck, U. S. M. Hospital, Memphis: Not at all.

Texas.—Albert De Lorenzi, Dallas: Very seldom.

Utah.—Frank A. Druehl, Salt Lake City: Not oftener than once a month.

Vermont.—W. T. Root, Brattleboro: Never (practically).—L. H. Greene, Montpelier: Very seldom.

Virginia.—H. B. Hall, Fredericksburg: Rarely ever.—Wm. W. Kolb, U. S. Marine Hospital Service, Norfolk: I regret to say that it is impossible for me to answer the queries sent me; for the past twelve years I have been in this service, and during that period I have had no occasion to make up a plaster. All plasters used in the service are of the rubber combination.—Wm. Henry Scott, Richmond: Probably once a month.

Washington.—Henry E. Holmes, Seattle: Very seldom.—Lot Wilbur, Snohomish: None now-a-days.—George H. Watt, Pullman: I haven't prepared a plaster since I came, two years ago.

Wisconsin.—R. A. Sauerhering, Mayville: Once in a month, diachylon plaster (Hebra).—Adam Conrath, Milwaukee: None to speak of. Make about eight or ten for our German customers according to P. G. and other German works.

2. *What official plasters have you prepared during the past year?*

None (or statement to that effect) is the answer given by the following pharmacists: G. G. C. Simms, F. M. Criswell, J. J. Barnet, G. A. Knabe, E. F. Klein, J. A. Junkind, Wm. W. Kerr, J. W. Fletcher, Dr. Bond, J. H. Dawson, C. H. Wells, J. K. Williams,

E. S. Collins, Dr. J. B. Crum, R. H. Land, D. E. Smithson, A. E. Ebert, M. N. Porter, W. M. Benton, G. W. Sohrbeck, G. A. Hillelert, C. G. Moore, Dr. F. S. Clinton, Dr. G. W. Sloan, Dr. J. N. Hurty, H. W. Mehl, Geo. Leis, Simon N. Jones, W. H. Averill, J. F. Belt, Wm. Votteler, F. C. Godbold, Caldwell Sweet, N. S. Harlow, A. G. Schlotterbeck, J. H. Baughman, C. H. Price, W. R. Perry, Geo. McDonald, S. F. Boyce, C. H. Huhn,-Miss J. A. Wanous, J. A. Shreve, J. F. Moore, A. Brandenberger, Wm. Mittelbach, E. A. Starz, N. A. Kuhn, P. B. Myers, J. H. Schmidt, D. L. Cameron, Charles Holzhauer, G. W. Parisen, Dr. W. G. Gregory, T. D. McElhenie, W. H. Rogers, A. V. Pease, W. A. Brown, W. D. Grace, Eugene Hartnet, E. S. Dawson, Jr., C. W. Snow, C. W. Holmes, Dr. Henry Schmid, Wm. Hauenstein, W. G. Smith, Wm. Simpson, H. T. Hicks, H. E. White, J. W. Sullivan, J. H. Johnson, Azor Thurston, A. W. Miller, S. W. Heinitsh, J. H. Redsecker, J. L. Lemberger, Dr. J. A. Miller, Dr. Louis Emanuel, John F. Patton, H. C. Plenge, L. T. Dunning, F. A. Brecht, D. F. Jones, F. H. Peck, A. D. Lorenzi, Lot Wilbur, W. F. Root, P. C. Candidus and N. S. Whitman.

Following are classified the answers from those who have made any official plasters during the past year:

Opium and belladonna were the only official plasters prepared by W. S. Thompson during the past year.

Lead, adhesive, and pitch with cantharides: A. F. Wood, Jr., E. A. Gessner.

Lead and cantharides: H. J. Lamar, C. K. Partridge, J. A. Broe, and R. A. Sauerhering.

Cantharides: W. C. Field, G. W. Boyd, C. A. Rapelye, H. A. Elliott, E. L. Milhau and C. S. Erb.

Opium and pitch: W. J. Woodman, and L. S. Smith.

Lead plaster: Harry Brisley, A. J. Ward, Charles A. Walter, G. W. Voss, G. L. Hechler, C. H. Butler, and Adam Conrath.

Cantharides, Burgundy pitch, opium and soap: Jos. Jacobs.

Capsicum and Cantharides: Prof. Searby.

Belladonna: G. W. Kennedy, C. M. Ford (just one), R. H. Dimock (and anodyne occasionally).

Diachylon, pitch with cantharides, opium and cantharides: W. A. Spalding.

Burgundy pitch: N. Gray Bartlett, H. E. Holmes (two the last six months).

Belladonna, roborans, and others after physician's own formula: Dr. W. C. Alpers.

Resin: H. B. Hall.

Resin and belladonna: E. A. Sherwin.

Resin and lead plaster: O. E. Thomas.

Belladonna and lead: Leo Eliel, J. B. Moore.

Emp. picis Burg., 3; *Emp. plumbi*, 6; *Emp. Saponis*, 1 or 2; *Emp. Ammoniac*, 1: R. I. Eads.

Soap plaster: J. W. Wittmer.

Cantharides, opium and belladonna: I. L. Lyons.

Lead and pitch: W. A. Robinson and O. W. Krueger.

Cantharides and belladonna: H. P. Hynson.

Mercury: F. H. Bradley.

Opium and Mercurial: C. H. Gaus.

Salicylic acid with *soap plaster, opium* and *galbanum:* W. A. Smith.

Empl. belladonnæ, plumbi, and saponis: F. A. Druehl.

Emp. plumbi, emp. ammoniaci cum hydrarg.: John T. Moore.

Emp. plumbi iodidi, emp. picis c. canth.: Wallace Procter.

3. *Are not your physicians satisfied with the standard brands of rubber-combination plasters?*

Yes (including such answers as "certainly," "entirely so," "they are," or words to this

effect). F. M. Criswell, Geo. W. Poyd, G. A. Knabe, E. F. Klein, J. A. Junkind, Dr. J. B. Bond, Harry Brisley, J. H. Dawson, C. M. Ford, A. J. Ward, C. H. Wells, Charles A. Rapelye, W. A. Spalding, E. A. Gessner, E. S. Collins, Dr. J. D. Crum, R. H Land, Jos. Jacobs, D. E. Smithson, W. M. Benton, G. W. Sohrbeck, G. A. Hillebert, C. G. Moore, Dr. Fred. S. Clinton, Dr. J. N. Hurty, J. W. Wittmer, Fletcher Howard, H. W. Mehl, J. F. Belt, Wm. Votteler, C. K. Partridge, Caldwell Sweet, J. A. Broe, A. G. Schlotterbeck, S. A. D. Sheppard, G. T. Scott, F. W. R. Perry, S. F. Boyce, C. H. Huhn, J. F. Moore, Adolph Brandenberger, O. W. Krueger, Wm. Mittelbach, Emil A. Starz, P. B. Myers, A. V. Pease, W. A. Brown, Wm. D. Grace, Eugene Hartnet, D. L. Cameron, G. W. Parisen, Wm. H. Rogers, C. H. Butler, W. A. Smith, C. W. Holmes, E. S. Dawson, Jr., C. W. Snow, Charles S. Erb, W. G. Smith, Lars Christianson, J. W. Sullivan, G. W. Voss, G. L. Hechler, J. H. Johnson, A. W. Miller, S. W. Heinitsh, J. L. Lemberger, John F. Patton, L. T. Dunning, F. H. Peck, W. F. Root, Lot Wilbur, R. A. Sauerhering, L. H. Greene, F. A. Druehl, P. C. Candidus, and N. S. Whitman.

Yes, the modern physician does not know that there are other kinds. W. W. Kerr.

Think they are (or words to that effect, including such answers as "fully so, I think," etc.). G. G. C. Simms, Prof. Searby, Charles A. Rapelye, H. J. Lamar, M. N. Porter, and Henry C. Plenge.

They seem to be (or words to that effect). J. W. Fletcher, J. J. Barnet, Dr. W. G. Gregory, H. E. White. Dr. J. A. Miller, O. E. Thomas, H. B. Hall, Adam Conrath, A. P. Preston, Dr. G. W. Sloan, R. I. Eads, N. S. Harlow, C. H. Gaus, and J. G. Steele.

Yes, as a rule. Leo Eliel and E. A. Sherwin.

As a rule, yes, but there are some physicians who insist on every plaster being made freshly. Dr. W. C. Alpers.

As far as I am able to judge, they are (or words to that effect). L. S. Smith and W. J. Woodman.

The rubber is preferred. W. S. Thompson.

Yes, they, however, very rarely prescribe plasters. H. E. Holmes.

In part. D. F. Jones.

Pretty well. Charles A. Walter.

Suppose so, as they prescribe no other kind. Simon N. Jones.

They order them. Charles H. Price.

It is a very unusual occurrence to have objections made in regard to them. Wm. C. Field.

Seemingly, but there are few calls for plasters by physicians. A. De Lorenzi.

Cannot say (or words to that effect). H. P. Hynson, I. L. Lyon, J. H. Baughman, and H. A. Elliott.

Apparently, as they never prescribe others, except some cantharides or adhesive. Wm. Simpson.

They appear to prefer them as they prescribe them. F. C. Godbold.

They prescribe belladonna (etc.). H. T. Hicks.

They seem to be; physicians, however, in my experience prescribe very few plasters of any kind. J. B. Moore.

Yes; they use them anyhow. J. H. Redsecker.

But one physician prescribes plasters; he specifies a proprietary with ten drops of oleoresin of capsicum to be rubbed on the surface. Dr. Louis Emanuel.

Most are. R. H. Dimock.

Always, where they have taken pains to enquire. Wm. H. Scott.

They are, and wish no other. George McDonald.

With the exception of one. G. W. Kennedy and A. F. Wood, Jr.

Such as they prescribe; limited almost wholly to belladonna and its combinations. W. A. Robinson.

Have to be. Miss J. A. Wanous.

They prescribe them, and I hear no complaint. J. H. Schmidt.

None are used by physicians here. John A. Shreve (Port Gibson, Miss).

With the exception of cantharides and thapsia, rarely ever prescribed. Charles Holzhauer.

I think so, but they very seldom order any. T. D. McElhenie.

Physicians do not order plasters at all. Wm. Hauenstein.

Physicians prescribe in inches the rubber base spread on muslin, to the exclusion of same spread to order on skin. E. L. Milhau.

All dermatologists use the above combination (rubber) or Unna's Mull. Dr. Henry Schmid.

All seem to be, and the general public much more so. F. H. Bradley.

Mr. Ebert: I do not own or control physicians, and therefore do not know whether or not they are satisfied.

Mr. J. K. Williams: I think they must be. The profession now as a rule consider the use of ordinary so called "strengthening" plasters as of no value. Belladonna and capsicum are occasionally written for, but mostly on oral order. Right here would say that physicians nowadays are much given to giving their patients verbal orders to get this and that so as to save the patient the additional cost of a prescription at the apothecary's; then again, physicians are fast becoming our competitors in that they carry a regular stock of remedies and hand them out from their pocket. A death has just occurred here (Hartford, Feb.) from the slovenly way medicine was dispensed by the M. D. He left six morphine tablets in a tumbler, and the wife filled the tumbler with water and gave the husband a drink of water as she supposed.

Mr. N. Gray Bartlett: Cannot say; they rarely write for plasters of any kind, though they doubtless occasionally advise their purchase.

Dr. J. A. Koch: Physicians are satisfied everywhere with the standard brands, but the rubber-combination plasters cause a dermatitis and eczema. The lead plaster masses obviate this.

Mr. W. H. Averill: The only plaster used by our physicians is surgeon's adhesive for surgical dressings. They use no plasters whatever, except occasionally a belladonna.

Mr George Leis: They are, and prefer them to those made by the pharmacist.

Mr. Wallace Procter: Physicians seldom prescribe them in writing, but I believe they are satisfactory.

Mr. John T. Moore: They prescribe them, specifying maker. They presumably get results.

4. *Which do you consider superior, the official or the rubber-combination plaster masses?*

Official.—Miss Wanous and Messrs. A. F. Wood, Jr., Collins, Ebert, Averill, Partridge, H. A. Elliott, Sullivan, Kennedy, Steele, Dr. Koch and Thomas answer *Official.*

Rubber Combination.—Drs. Bond, Crum, Clinton, Sloan, Hurty, Gregory, Searby, Miller, and Messrs. Simms, Criswell, Boyd, Knabe, Klein, Junkind, Brisley, J. H. Dawson, Ford, Ward, Wells, Rapelye, Spalding, Woodman, L. S. Smith, Land, Jacobs, Smithson, Bartlett, Sohrbeck, Hillebert, C. G. Moore, Mehl, Leis, Belt, Votteler, Godbold, Sweet, Broe, Schlotterbeck, Baughman, Sheppard, G. T. Scott, McDonald, Boyce, J. F. Moore, Krueger, Mittelbach, Starz, Kuhn, Myers, Pease, Brown, Grace, Hartnet, Cameron, Parisen, Bradley, McElhenie, Rogers, C. W. Holmes, Snow, W. G. Smith, Christianson, Voss, Hechler, A. W. Miller, J. B. Moore, Pile, Heinitsh, Lemberger, Dunning, Peck, Root, Greene, W. H. Scott, Druehl, Whitman, Candidus and Wilbur reply *Rubber Combination.*

Qualified Replies.—The following replies were so qualified as not to be definitely classified as above:

Mr. Eads: Probably the latter, owing to greater uniformity.

Dr. Henry Schmid: A prepared plaster by a reliable manufacturer is the best.

Mr. Redsecker: Don't know. The rubber, mixed by machinery, are possibly more uniform.

Mr. Duble: As far as convenience, the rubber combination.

Mr. Sherwin: Except in some cases, faith of the patient has largely to do with it.

Mr. Kerr: Perhaps not much difference therapeutically; the latter more elegant.

Mr. Fletcher: Perhaps about equal in therapeutic value.

Mr. Eliel: If it is *results* you are after, the official are superior.

Mr. Benton: I have no experience with the official.

Mr. Jones: The official in preference to the products of many manufacturers.

Mr. Lyons: As a pharmacist there can be but one opinion, otherwise there is no necessity for a pharmaceutical education. [There is food for thought in this reply—Shall we or shall we not judge things on their merits only?—W.]

Mr. Price: The old plaster masses have passed away.

Mr. J. K. Williams: There is no question but that the old fashioned Adhesive Plaster is less irritating than the rubber base, and in many cases it retains its hold longer.

Mr. Shreve: Some of the latter [rubber] are much superior, in my opinion.

Dr. Alpers: The machine-made plasters are superior in looks and finish, but generally inferior as a medicine.

Mr. Hauenstein: For cleanliness the rubber combination; but for effect the official.

Mr. Erb: Rubber combination if not superior at least equally as good.

Mr. Simpson: The rubber combination seems to give satisfaction, but being an old timer, I turn to my first love.

H. E. White: I think one *practically* as good as the other.

Mr. Huhn: The latter for all practical purposes and convenience especially.

Mr. Emanuel: I am 46 years old, and managed to get along without the use of a plaster; mankind would live as long if there were no plasters at all.

Mr. Patton: Without questioning the honesty of the plaster, we consider the rubber the best.

Mr. Brecht: The latter undoubtedly as a seller.

Mr. Conrath: To stick to the back, rubber.

Mr. Sauerhering: In regard to elegance, the rubber combination is better, being not so brittle.

Mr. H. E. Holmes: The rubber combination plasters are no doubt superior in finish and probably as effective.

Mr. Hall: Rubber combination a great improvement.

Mr. Butler: The latter as a rule.

Mr. J. T. Moore: In some cases the rubber combinations are as good as the official; in others the official are probably better, possibly because hand-spreading generally dispenses more of the mass.

Mr. Procter: Rubber for convenience and cleanliness.

5. *Do you prefer making plasters yourself to buying them ready made?*

Affirmative—Messrs. Ebert, Hynson, Elliott, Krueger, Klein ("but demand doesn't justify") and Wood ("but no money in it") say they *prefer to make.*

Negative.—Messrs. Simms, Thompson, Criswell, Field, Boyd, Brisley, Barnet, Knabe, Junkind, Kerr, Fletcher, J. H. Dawson, Ford, Ward, Wells, Rapelye, Dimock, Gessner, L. S. Smith, Lamar, Land, Jacobs, Smithson, Benton, Bartlett, Woodman, Sohrbeck, Hillebert, C. G. Moore, Wittmer, Howard, Mehl, Leis, Averill, Belt, Votteler, Sweet, Harlow, Broe, Schlotterbeck, Baughman, Sheppard, G. T. Scott, Price, Perry, McDonald, Boyce, Huhn, Shreve, J. F. Moore, Brandenberger, Mittelbach, Kuhn, Myers, Pease,

Grace, Hartnett, Parisen, Bradley, Gaus, McElhenie, Rogers, Butler, W. A. Smith, E. S. Dawson, Jr., C. W. Holmes, Snow, Erb, W. G. Smith, White, Christianson, Sullivan, Voss, Hechler, Johnson, A. W. Miller, J. B. Moore, Duble, Heinitsh, Lemberger, Kennedy, Thomas, Dunning, Brecht. D. F. Jones, Druehl, Whitman, Peck, H. E. Holmes, Wilbur, Root, Greene, and Drs. Bond, Sloan, Hurty, Clinton, Crum, Schmid, Searby Emanuel and Miller say they *prefer to buy*.

The following replies are not easily classified as above:

Mr. Spalding: Making plasters in retail stores is a lost art.

Mr. Eads: I do not, and I know how to make them, too; have spread hundreds.

Mr. Candidus: I have a machine, but do not like to make.

Mr. S. N. Jones: As for reputation and profit, prefer to make them; but physicians here usually specify some particular make.

Mr. Robinson: As a pharmacist, to make them; from a commercial standpoint, to buy them.

Mr. Brown: I do not. I consider plasters cause too much delay to customers.

Mr. Patton: The making or spreading of plasters, with the average, indeed with all retail druggists, is a lost art.

Mr. Sherwin: I want to give my clients the best. [No reply is inconsistent with this; all wish to do this very thing.]

Mr. Alpers: I prefer following the physician's instructions. [This is, of course, understood to be the attitude of all who have replied to the query.]

Dr. Gregory: I prefer anything that has a professional character.

Mr. Simpson: Now to tell the truth, I have done so little of late years that I prefer to have some one else to do the work for me.

Mr. Hicks: Professionally, I prefer to make; commercially, I prefer to buy.

Mr. Cameron: Outside some special formula which may be required by the doctor, I prefer buying them ready made.

Mr. Holzhauer: I would make a poor job of it, and don't want to learn.

Mr. Preston: Yes, for money; no, for comfort.

Dr. Koch: The Emp. Canth. I prefer to have freshly made: the others ready made, because they are cheaper for the patient.

Mr. Hauenstein: Is a pecuniary question.

Mr. Plenge: I would prefer making them on "general principles."

Mr. J. K. Williams: With the advance of manufacturing pharmacists, the art of plaster-making is gone from the average pharmacy.

Mr. Eliel: Used to prefer making myself; but am getting old and lazy like the rest.

Mr. Conrath: Would prefer to make them if there were a demand for the official.

Prof. Cline: I would prefer buying them ready made save in a few instances.

Mr. W. H. Scott: We do not prefer to make them as the ready-made are neater and more desirable.

Mr. Sauerhering: Except the above-named diachylon and cantharides, I buy all plasters.

Mr. Redsecker: We would prefer to make them for prescription, if they were used and we had facilities.

Mr. Partridge: Simply as a matter of convenience, prefer buying ready made.

Mr. J. H. Schmidt: Would make them myself only in emergency.

Mr. Starz: Yes I would, if physicians would use them.

Mr. J. T. Moore: Prefer making. (Doctors are not taught to appreciate what the Pharmacopœia offers them; consequently they don't prescribe.)

Mr. Procter: I like to make them if time serves.

6. *Do not pharmacists make more on their total plaster sales now than they did prior to the introduction of the manufactured rubber-combination plasters?*

Affirmative.—Messrs. Simms, Thompson, Knabe, Klein, Junkind, Brisley, J. H. Dawson, Ford, Ward, Wells, Rapelye, Gessner, Woodman, Jacobs, Smithson, Porter, Bartlett, Sohrbeck, Eads, Wittmer, Howard, Leis, S. N. Jones, Averill, Votteler, Partridge, Sweet, Harlow, Schlotterbeck, Sheppard, G. T. Scott, Boyce, Huhn, Shreve, Brandenberger, Mittelbach, Starz, Kuhn, Myers, J. H. Schmidt, Pease, Brown, Hartnet, Cameron, Holzhauer, Parisen, McElhenie, Rogers, Butler, W. A. Smith, E. S. Dawson, Jr., Snow, C. W. Holmes, W. G. Smith, Hicks, Christianson, Sullivan, Voss, Hechler, Johnson, Sherwin, J. B. Moore, Pile, Duble, Lemberger, Kennedy, Patton, Dunning, Brecht, Root, Greene, H. E. Holmes, Whitman, Wilbur, Conrath, Procter, Candidus, and Drs. Hurty, Searby and Miller say they do.

Messrs. Field, Boyd, Kerr, Fletcher, A. F. Wood, Jr., Benton, C. G. Moore, Eliel, Mehl, Belt, Robinson, Perry, McDonald, Krueger, Grace, Bradley, Hauenstein, Erb, Simpson, White, Plenge, Thomas, Watt, Druehl, D. F. Jones, and Drs. Sloan and Schmid think they do.

Negative.—Messrs. Dimock, Collins, Steele, Price, Land ("but more satisfaction") and Dr. Crum say they do not.

Messrs. Hynson, Elliott, Ebert, Walter, Lyons, Broe, Baughman and Mr. Emanuel think they do not.

Qualified Replies.

Dr. Clinton: Yes, because they save time, therefore are cheaper; are more uniform, hence in greater demand among physicians; neater, thereby appealing to the patients.

Dr. Bond: Far more; [words to that effect] Messrs. Lamar and L. S. Smith.

Mr. Criswell: Probably twenty to fifty times as much.

Mr. W. H. Scott: Greatly more; it is so much greater that I would fear to name amount.

Mr. Spalding: Less profit per cent., but more plasters sold.

Mr. Alpers: No. There is no profit in selling ready made plasters.

Mr. Preston: On general principles, no. Prices are terribly cut.

Dr. Gregory: Considerably increased volume, yes. On plasters prescribed, no

Mr. Heinitsh: Yes, providing they are not sold at cut rates.

Mr. Gaus: They sell twenty plasters to-day to one twenty-five years ago; as to profits, that depends whether they sell at a profit or about cost and throw in a chromo.

Mr. J. K. Williams: Certainly they do, for the sale is a thousand fold more to-day than forty years ago. It's largely a habit, once on always on, and they feel a sense of loss without it, just as a woman would without her corset—a mechanical support, you know.

Mr. Milhau: I do not.

Mr. J. T. Moore: They make more. The customer *knows what to ask for;* advertising has immensely increased quantity used.

7. *Have you not some general comments to make on A. Ph. A. Query No. 3? "To what extent are official plasters employed in the practice of Pharmacy and Medicine?"*

District of Columbia.

Mr. Simms: I have not made an official plaster since the last Pharmacopœial Convention adjourned. I do not think they are made by pharmacists, or prescribed by physicians. I think all of them could well be left out of the Pharmacopœia.

Mr. Thompson: No other innovation by the manufacturing pharmacist has been as acceptable to the dispenser as the ready-made plaster. The dispenser rarely, if ever, got paid for the time and trouble of spreading a hand made plaster.

Mr. Criswell: The official plasters are so little used that they might be omitted from the Pharmacopœia.

Mr. Field: The ready made plasters are, in my opinion, much more used than the official than ever before. I think where the best ready-made plasters are used when a physician calls for a plaster, that the result is much surer than when we make them ourselves.

ALABAMA.

Mr. Candidus: I was the first one in the U. S. to make plasters by machinery, in Philadelphia, in 1850.

ARKANSAS.

Mr. Klein: Aside from the various rubber-combination plasters, the demand for official plasters, excepting lead plaster, is very limited in this section [Hot Springs], and seldom prescribed by our physicians within the past few years. On the whole, the rubber-combinations are preferable to and more satisfactory than official preparations, besides more elegant and practical.

Mr. Junkind: This query might as well have included everything dispensed by the average pharmacy to-day; because the majority of pharmaceuticals are purchased ready made.

Mr. Kerr: In the matter of ready-made plasters, the advantage is greatly in favor of the modern product, and it is about the only place in pharmacy where that is true.

Mr. Fletcher: I am a strong advocate of home-made pharmaceuticals, but make an exception in favor of the ready-made plasters.

Dr. Bond: I would suggest that they (the official plasters) be omitted with some other rubbish, or at least most of them.

ARIZONA.

Mr. Brisley: The pharmacist preparing them considers his labor and time out of proportion to his remuneration, and, considering the good qualities of the factory made products, this line of preparations, official in the U. S. P., could, in our estimation, well be omitted.

CALIFORNIA.

Prof. Searby: Our physicians almost universally decry plasters, claiming that they do no good. They object to self-medication, and perhaps regard the popular use of plasters as one of the commonest practices in this line. But they also use liniments less than formerly, prescribing massage, baths, electricity, compresses, hypodermic injections, rest, exercise, surgical operations and surgical appliances (instruments), anything rather than a plaster.

Mr. Steele: Plasters I believe to be "impromptu" at best, and think the best results obtainable from those spread by the pharmacist.

COLORADO.

Mr. Ford: This practice of depending upon large factories to supply us with ready-made U. S. P. preparations is fraught with great danger. It is likely to make simple tradesmen of us all. The economical manufacture of plasters and an elegant and faithful product more than any other preparation in the U. S. P. are dependent upon such machines as cannot be placed in a drug store. But the man whom we allow to make our plasters, and pills, needs curbing and controlling, for he aims ultimately to make simple syrup for us. In fact, even now the up-to-date pharmacy is constructed without the laboratory adjunct, or with but a miniature one, and the pharmacist of the future, though skilled and trained when he graduates, will soon lapse into a condition of innocuous desuetude.

Mr. Ward: Think they are good, to have some standard for manufacturers to go by, and to be relied upon by pharmacists.

Mr. Wells: They are very seldom prescribed; being made extensively in conjunction with other surgical dressings they have grown to belong to the patent or proprietary lines.

CONNECTICUT.

Mr. Rapelye: It seems almost useless to continue plasters, in their present combinations at least, in the new edition of the U. S. P., as they are practically obsolete and it is now a survival of the fittest, viz., the rubber combination plaster.

Mr. Dimock: The convenience of rubber plasters and merit of best have largely displaced hand made, and at first physicians prescribed many rubber; but they seem now to discourage their use, as they soon became generally used without prescription, and their use giving no encouragement to the practical pharmacist to seek skill in spreading (as unless especially directed the rubber is dispensed), a well-spread plaster is the exception.

Mr. Spalding: I think we make about one plaster to every five hundred which we sell.

Mr. A. F. Wood, Jr.: Should say (official plasters were employed) very little.

Mr. J. K. Williams: I, as a rule, spread freshly all cantharides blister plasters, because I find them more reliable and thorough in their work which frequently is imperative, always accompanying the blister with instructions to wash the part with hot vinegar before applying the blister.

FLORIDA.

Dr. Crum: No comment, I think, necessary, as, in my opinion, the ready-made plasters are here to stay; they are economical of time, and as efficient as any pharmacist can make.

Mr. Woodman: It seems to me that it is very evident, from the large amount of pharmaceutical preparations prescribed by physicians which are not official, that they prefer some plasters and preparations all ready made for them.

Mr. L. S. Smith: Judging from my business experience, and we have a varied assortment of prescriptions from people coming to this winter resort (St. Augustine), official plasters are being used less year by year, and I should say they were a useless addition.

ILLINOIS.

Mr. Ebert: From my experience official plasters are but little employed at present, for the reason that the general medical practitioner is but slightly familiar at the present time with the official drugs and medicines, and as he is supplied very freely *with the knowledge of the superiority* of ready-made remedial agents by the glib and silver-tongued representatives of nostrum manufacturers, it is a natural result that he from want of knowledge is gullible and takes the bait, dosing his patients with these ready made prescriptions.

Dr. Koch: I think all plasters should be dropped from the United States Pharmacopœia except emplastrum cantharidis.

Mr. Benton: My experience is that there is practically no demand of the pharmacist to spread anything but an occasional blister. Belladonna is one most called for of the medicated.

Mr. Bartlett: I think old plaster bases should be dropped from the United States Pharmacopœia, rubber base combinations being substituted.

INDIAN TERRITORY.

Dr. Clinton: I believe they are fast becoming relics of the un-progressive, obsolete and nauseous past. I have no statistics at hand to correctly answer the question, other than to say that they are going out of use, except in emergency cases.

Mr. Hillebert: I have worked in towns of from one to twenty thousand inhabitants during the past twelve years, and I have never received a prescription for a strictly United States Pharmacopœia plaster, and very few of any kind.

INDIANA.

Dr. Sloan: I think better results would be obtained if the ready-made plasters were

not made porous. We used to make many Burgundy pitch plasters spread on sheep skin; they were a difficult task, and often went out in a bungling manner. This does not happen now.

Mr. Eliel: The official plasters might profitably be dropped from the United States Pharmacopœia. Physicians do not prescribe any but rubber combination plasters. Occasionally we get some *foreign* (German, Polish or Russian) prescriptions calling for a pharmacopœial plaster, but none from Americans, and for the foreign prescriptions we use their respective pharmacopœias.

Dr. Hurty: In my experience, not used at all.

Mr. Eads: Few proprietors and assistants of pharmacies are capable of spreading a plaster fit for application; failure by hand is more frequent than by machine. I think the reign of the pharmacy-made plaster has been passed.

IOWA.

Mr. Wittmer: Official plasters are a thing of the past.

KENTUCKY.

Mr. Averill: My knowledge of the status of plaster employment is confined to this community only (Frankfort). With the exception of the belladonna occasionally ordered by the physicians, no other whatever is prescribed by them. The doctors seem to have forgotten that emplastra of official composition are in existence. We have a large sale across the counter of ready-made plasters.

LOUISIANA.

Mr. Godbold: The only ready-made plaster that I do not consider an improvement on what I can turn out is a fly or blistering plaster, for which the demand is very limited.

Mr. Lyons: We hold that any goods which allow any ignorant person the opportunity of dispensing are prejudicial to pharmacy, and we make it a point to never dispense proprietary goods unless specified by the physician, and then we give the make he orders.

Mr. Keppler: The plaster business is in the hands and controlled by the manufacturers. The physicians and the public prefer the manufactured goods. We only prepare the cantharides plasters, the formula of the United States Pharmacopœia being a very reliable preparation, and when prepared from fresh cantharides gives more satisfaction than the cantharides plaster kept in stock. We used to make pitch plasters, but of late years we never have any call for these goods.

MAINE.

Mr. Broe: The calls for United States Pharmacopœia plasters are limited, compared with the sale of other plasters called for by physicians and the public.

Mr. Schlotterbeck: Drop plasters from the official list of the Pharmacopœia.

Mr. Robinson: From my personal experience, it is my opinion that in this section of Maine (Auburn) plasters of all kinds are not in so large demand as a few years ago. The doctors are not writing for them so often, and the public demand is less. As to official plasters, their position in the trade is quite like that of the official ointments—unimportant.

Mr. Harlow: There is here and there an old school physician who sticks to his old text-books, and orders plasters spread as of old. As a rule, however, he is easily convinced that the new way is better, and persuaded to fall into line with modern practice. But in so converting him we are apt to lose more than we gain, for it sets him to thinking, and he ends by adopting a long line of ready-made proprietary medicines, and we lose the legitimate profit on our own labor and skill.

MARYLAND.

Mr. Hynson: Respectfully refer you to the table included in report of Committee on Practical Pharmacy and Dispensing, p. 77, Proceedings of the A. Ph. A. for 1899.

Plasters are no longer considered to be logical treatment by advanced physicians, excepting for strictly local troubles.

Mr. Elliott: Some ten or fifteen years ago I would spread on an average one plaster a day. Now it is seldom I have a plaster to spread. So far this year I have not spread one, and only about one blister plaster a month.

MASSACHUSETTS.

Mr. Price: Physicians do not use twenty per cent. of the plasters they formerly used. The public use many more.

MICHIGAN.

Mr. McDonald: We think the making of plasters by pharmacists may be classed among the *lost arts*. We learned to spread plasters in a fairly acceptable way of an old English druggist about 43 years ago. We think that to-day the percentage of pharmacists who can spread a fairly decent plaster is practically *nil*.

MINNESOTA.

Mr. Boyce: With the advantage of buying ready-made plasters of all kinds, do not find it profitable or necessary to make official plasters.

Mr. Huhn: In my judgment, the official plasters are so seldom used that they should be dropped, and in their stead something of more general use and greater importance added. The difficulty lies chiefly with the education of the physicians. They rely entirely too much upon the advertisement literature that is strewn broadcast, for the remedy which they use.

Miss Wanous: Have never made one from U. S. P. Hebra's diachylon plaster is the only formula I use. Thapsia and advertised belladonna and cantharides plasters are specified by physicians generally.

MISSISSIPPI.

Mr. Moore: I regard plasters made by reputable manufacturers far superior to those made by the pharmacist. I would recommend that they be dropped from the Pharmacopœia.

Mr. Shreve: I have not included in answering the above questions any reference to the ceratum cantharidis, which is not strictly speaking a plaster. This preparation is now seldom used by physicians here, and I can safely say that one dozen plasters spread from the cerate will cover my sales for an entire year.

MISSOURI.

Mr. Mittelbach: Plasters as well as other things not made by the retail pharmacist, should be left out of the next Pharmacopœia; or if such things are still kept in, then enlarge the Pharmacopœia enough so as to make it a general reference work.

Dr. Klie: I find surgeons' adhesive plasters as far as I have tried them a delusion and a snare. They generally excoriate the skin, especially in children. I had to fall back upon the pharmacopœial Empl. adhesivum. This is all right, although primarily not as sticky as the india rubber plaster.

Mr. Brandenberger: It has the earmarks of the plaster manufactories.

Mr. Krueger: Don't think physicians use them as often as in former years. Due to absence of practical pharmacy being taught in most medical colleges.

NEBRASKA.

Mr. Schmidt: My experience would show that aside from Emp. bellad. (and that spread) there is very little employment of official emplastra. I have some occasion to use Emp. plumbi to prepare Ung. diachylon.

Mr. Pease: The ease of selling and celerity with which the user can obtain the rubber combination plasters has encouraged their use.

NEVADA.

Mr. Brown: I think the process of official plasters impracticable on account of the time required in manipulating, and inelegance of appearance of shop-made plasters compared with the laboratory product.

NEW HAMPSHIRE.

Mr. Grace: As far as my observations go, none whatever, for they are made so much better by machinery.

Mr. Whitman: We have practically no call for the official plasters, our physicians getting good results from the rubber combinations. The only plaster we prepare is to take one ordinary belladonna and dot it over with Ung. cantharidis. Our doctors call it a Stuart plaster and obtain good results.

NEW JERSEY.

Mr. Cameron: In American pharmacies, the old method of making plasters has been entirely superseded by the rubber combination.

Mr. Holzhauer: I really think that a well made U. S. P. plaster would be better from a medical point of view; but don't think such a plaster could be bought except in rare cases, so that it is practically out of the question, and we are shut up to the rubber-base plaster regardless of what we may think. The comfort of the wearer is certainly in favor of the latter.

Mr. Parisen: Pharmacists do not have the appliances, nor have they the experience in spreading plasters that the several manufacturers have. In former days there was enough of it to do to become quite proficient in the work; but very seldom do we have any one call for materials even for spreading a plaster.

NEW YORK.

Mr. Butler: It is improbable that physicians will ever go back to old methods, unless in an exceptional case where their formula is not furnished by manufacturers.

Mr. Bradley: I am inclined to think that the use of plasters, as far as the physician is concerned, is fast decreasing. But as to the public in general they still continue to use an immense quantity of them. On the whole they have come to be viewed more in the light of a patent medicine than as a standard pharmaceutical preparation.

Dr. Gregory: Plaster medication by physicians is about over. The dermatologists are the only ones using them. They accept rubber masses; sorry to see it. Lead plaster is largely prescribed here as an ointment base.

Mr. McElhenie: The only plaster I have occasion to spread is ceratum cantharidis on rubber adhesive.

Mr Rogers: Think our physicians always have in mind the rubber combination plasters when prescribing.

Mr. Holmes: Years ago we spread lead plaster and cantharides, but always dreaded the task, and really did not get any more for the time it took than we do now. Further we always kicked on it and begged the doctors not to order when they could get out of it.

Mr. Hauenstein: Only wish to say that when belladonna is required, the physician uses a freshly-made ointment which is always certain in its results; as rubefacients or counterirritants mostly mustard and sometimes a capsicum plaster is prescribed. Excepting the cantharidal blister and mustard, I think that the plaster habit among medical men is becoming obsolete.

Mr. Erb: To a limited extent such as a blister or possibly a mercurial; in such cases some physicians still cling to the old style, but this occurs very rarely now a-days.

Mr. Milhau: Though plaster masses have gone into disuse, there are no rubber masses spread to replace the majority of them. The old plasters are still sometimes prescribed.

NORTH CAROLINA.

Mr. Simpson: As far as my experience goes, physicians seem to know as little about the official plasters as they do about the Pharmacopœia itself. Their needs being pretty well satisfied with the machine-made plasters, they naturally incline to them, and it seems that they have come to stay.

Mr. Hicks: My experience during the past sixteen years leads me to believe that the physicians have lost sight of the U. S. P. plasters altogether, except possibly cantharides.

NORTH DAKOTA.

Mr. Sullivan: I think the pharmacists are greatly to blame for the physicians using the rubber combination plasters instead of the official.

OHIO.

Mr. Hechler: The later graduates of medicine seldom use the official plasters, but the older practitioners occasionally do.

Mr. Azor Thurston (Grand Rapids): In a business experience of fifteen years, I have never had a call for an official plaster.

Mr. Wm. Simonson: I have, viz.: The query is in keeping with the spirit of the management of the A. Ph. A.—eminently unscientific; it is purely a trade question, for traders dominate the A. Ph. A., and is issued in the interest of the traders (or manufacturers) whose employee you are.

[This is all Professor Simonson has to say on the subject. It struck me that A. Ph. A. query No. 3 was not an unnatural one, pending pharmacopœial revision. Twelve United States Pharmacopœia formulas are involved in the question, and its discussion seems well within the province of the A. Ph. A. Presumably no one else will question the motive of the Committee drafting the query, and, so far as the writer is concerned, he has endeavored, with the kind co-operation of representative members of the A. Ph. A. and Am. Med. Association, to throw as much light upon the subject as possible. If any one honestly believes this paper to be prejudiced in favor of any one branch of pharmacy over another, it is his privilege to say so. We are simply seeking the truth, and truth is unprejudiced.—S. W. W.]

OREGON.

Mr. Sherwin: Think the large laboratories are in a position to obtain ingredients more uniform in strength, and should be subject to the same restrictions as the small dispenser.

PENNSYLVANIA.

Mr. Heinitsh: It is impossible for the pharmacist to compete either in price or appearance with the manufacturers, as they have the advantage in every way to surpass the pharmacist.

Mr. Pile: In my section it is a great rarity for a physician to prescribe any sort of official plasters. Druggists are glad it is so, for very few care to spread a plaster.

Mr. Redsecker: The newer generation pharmacists know nothing of making plasters. We think it would be much better for the patient if the doctor made the remedy fit the disease, instead of the disease fit the remedy. We now have nothing but ready-made medicines, and the grocer or butcher might as well hand them out. Pharmacy with ready-made pills, tablets, plasters, extracts and pharmaceuticals generally, has made pharmacy no longer a profession, but a business pure and simple, and the druggist (let us call him by his right name, for he is not a pharmacist) bears no more relation to the goods he sells than the grocer does to his canned goods. "Es ist alles hutlerei." It would be better for the professions of medicine and pharmacy and for the patient, if the doctor diagnosed his case, and then prescribed what was indicated, than to order this or that ready-prepared remedy. Don't say I am a pessimist or an old fogy. I am neither; but am simply stating plain facts, and trying to keep abreast of the head of the column.

Mr. Lemberger: The therapeutic value of the emplastra generally is largely overestimated, excepting mustard, capsicum, cantharides and belladonna.

Dr. Miller: In my experience the large number of plasters used are more for mechanical support than on account of their medicinal properties. Any plaster that sticks to the skin will answer the purpose.

Mr. Emanuel: My experience is that physicians do not regard the use of plasters as good therapeutics. They may as well be discarded from the Pharmacopœia.

Mr. Patton: I know of no manufactured pharmaceutical product that offers so hopeless a field for competition on the part of the pharmacist as that of plaster making. We bless the plaster maker for relieving us of a very unsatisfactory part of our work. There never were enough plasters sold to justify the use of anything but the most primitive machinery. Hence the finished plaster was anything but sightly. There has been no better addition to the manipulation of modern pharmacy than that of the ready-made plasters.

Mr. Procter: Official plasters are practically superseded by the rubber combination, being only prescribed by physicians of long practice, who were familiar with the old styles.

South Carolina.

Mr. Thomas: The official plasters are very rarely used in this section. In fact plasters are rarely prescribed here by the best physicians.

South Dakota.

Mr. Brecht: Of the official plasters only cantharides, adhesive, belladonna and capsicum are used by physicians here; besides these a great many other plasters are sold over the counter.

Mr. Jones: In reply to query number 3, would say that, in my experience, official plasters have been employed to only a very limited extent.

Tennessee.

Mr. Peck: Three years practice and seven years in the Government service, and have never had occasion to make an official plaster.

Texas.

Mr. De Lorenzi: About the only plasters in demand or prescribed are belladonna (ready-made) and cantharides, mostly specified "make fresh."

Virginia.

Mr. Hall: Ready-made plasters are a great improvement on the old hand-made goods.

Mr. Scott: It is only a question of reliability of the made goods; if as represented, it appears that no one having use for a plaster would hesitate.

Washington.

Mr. Holmes: Plasters are sold almost entirely to the people without being prescribed by the physicians, the only plaster at all prescribed being belladonna plaster.

Mr. Watt: Plasters are not used by the doctors as much as they were in the past. The cantharidal is the principal one used, although quite a number are sold over the counter, such as strengthening, belladonna, etc.

Wisconsin.

Mr. Sauerhering: Plasters are not used as much now as formerly.

Mr. Conrath: The official plasters, or any resin or pitch plaster on kid, in the market, seem to be very seldom used. The pliability of the rubber combination plasters appears to be the main reason for this.

[A considerable number made no general comments.]

VIEWS OF REPRESENTATIVE MEMBERS OF THE AM. MED. ASS'N.

1. *When you prescribe medicated plasters, do you expect your order to be filled with those made in rubber-combination? Or, do you specify that the official mass (lead plaster or pitch combination) be used, intending that the plaster shall be prepared extemporaneously in the drug store?*

Expect Rubber Combination.—W. L. Allen, M. D, Davenport, Ia; J. S. Barnes, M. D., Milwaukee, Wis.; E. N. Brush, M. D., (unless otherwise directed) Baltimore, Md.; I. S. Bigelow, M. D., Dubuque, Ia.; R. B. Burroughs, Jacksonville, Fla.; W. M. Burroughs, Chicago; D. B. Collins, M. D., Madison, Wis.; R. H. Chase, M. D., Philadelphia; H. W. Coe, M. D., (ordinarily) Portland, Ore.; E. R. Corson, M. D., Savannah, Ga.; A. W. Cottrell, M. D., Phœnix, Ariz.; J. B. Eagleson, M. D., Seattle, Wash.; P. R. Fox, M. D., Madison, Wis.; Henry Gibbins, Jr., M. D., San Francisco, Cal.; H. A. Hare, M. D., Philadelphia; A. J. Hall, M. D., Natchez, Miss.; W. L. Howard, M. D., Baltimore; J. D. Hammond, M. D., Chicago; J. D. Griffith, M. D., Kansas City (not necessarily); B. F. Kingsley, (unless otherwise specified) San Antonio, Tex.; W. D. Middleton, M. D., Davenport, Ia.; N. L. North, Brooklyn, N. Y.; J. W. Parsons, M. D., Portsmouth, N. H.; G. W. Pendleton, M. D., Idaho Falls, Ida.; D. A. Robinson, M. D., Bangor, Me.; T. G. Simons, M. D., Charleston, S. C.; S. K. Spaulding, M. D., Omaha, Neb.; C. L. Sweet, M. D., (unless otherwise stated) Boise, Ida.; H. H. Stebbins, M. D., Tampa, Fla.; A. H. Tufts, M. D., (usually) Sioux Falls, S. D.; J. A. Watson, M. D., Asheville, N. C.; Charles K. Cole, Helena, Mont.; and I. A. Watson, M. D., Concord, N. H., expect the rubber combination plasters to be dispensed.

Expect Strictly Official Plasters.—James H. Buckner, M. D., Cincinnati (usually); C. K. Dickinson, M. D., Jersey City, N. J.; W. W. Torrence, M. D., Deadwood, S. D.; and H. C. Wood, M. D., LL. D., Philadelphia, expect strictly official plasters to be dispensed.

2. *Taking Belladonna plaster for example, are you not as well satisfied with the standard brands in rubber-combination as you are with the strictly official article prepared with a mass of resin and soap plaster?*

Affirmative.—Drs. Allen, Brush, Bigelow, Buckner, R. B. Burroughs, W. M. Burroughs, Collins, Chase, Coe, Corson, Cottrell, Eagleson, Fox, Gibbons, Hare, Hall, Howard (better), Hammond, Griffith, Kingsley (as a rule), Middleton, North, Pendleton, Robinson, Rucker, Simons, Spaulding, Sweet, Stebbins, Tufts (have had no cause for complaint), I. A. Watson, C. K. Cole and J. A. Watson say yes, or words to that effect.

Negative.—Drs. Dickinson, Torrence (I write what I wish, directing it to be spread on sheepskin), Wood [While Dr. Wood does not answer this question directly, it is evident from his letter that he prefers the official].

3. *Have you failed to get the local effects of belladonna from ready-made rubber combination plasters?*

Affirmative.—Drs. Bigelow (frequently), Coe (rarely), Dickinson, Gibbons (I believe so), Kingsley (I sometimes have had little or no results), North (yes, at times), Parsons, Rucker (can't say that I ever saw much effect from any), Torrence (believe any ready-made plaster exerts a very feeble medicinal influence).

Negative.—Drs. Allen, Brush, R. B. Burroughs, W. M. Burroughs, Buckner, Collins, Chase, Corson, Cottrell, Eagleson (not when a reliable article is furnished), Fox (not usually), Hare, Hall, Howard (not the last ten years), Hammond, Griffith, Middleton, Pendleton, Robinson, Simons, Spaulding, Sweet (when good articles are used), Stebbins, Tufts, J. A. Watson, C. K. Cole and I. A. Watson say no, or words to that effect.

4. *If so, do you not ascribe the negative results to a deficiency in the amount of drug present rather than to any defect in the mass employed?*

Affirmative.—Drs. Barnes, Bigelow, Collins, Chase, Coe, Corson, Fox (probably),

Howard (possibly, although the idiosyncrasy of the patient is a factor), Kingsley, North, Pendleton, Rucker, Sweet, J. A. Watson, and I. A. Watson ascribe negative results to deficiency in drug.

Negative.—Dr. Dickinson (in ignorance, perhaps, I ascribed it to the rubber holding the drug) and Dr. W. M. Burroughs.

5. *In your opinion, is any lead absorbed through the unbroken cuticle from a mass largely composed of diachylon or lead plaster?*

Affirmative.—Drs. Allen, Barnes, Burroughs, Collins, Coe (sometimes), Cottrell, Eagleson, Hammond, Pendleton, Spaulding, Sweet (a small amount), Stebbins and Tufts (it is quite possible).

Doubtful.—Drs. Brush, Chase, Fox, Parsons and Robinson express doubt, and a considerable number are non committal.

Negative.—Drs. Bigelow, Buckner, Corson, Dickinson (never), Gibbons (I have had no demonstration of it), Hall (very little if any), Howard (a rare exception), Griffith, Kingsley (I have never seen any such results), Middleton (can't say that I ever observed such absorption), North, Rucker, Torrence, J. A. Watson, I. A. Watson (have never seen any evidence of such result), W. M. Burroughs (very little if any), and C. K. Cole.

6. *If lead were thus absorbed, would it not be objectionable?*

Affirmative.—Drs. Allen (it would be in those cases requiring large surface to be covered, or in chronic cases where frequent renewals were necessary), Barnes (most decidedly), Bigelow, Buckner, R. B. Burroughs, W. M. Burroughs, Collins, Chase, Coe, Corson, Cottrell, Eagleson, Fox, Gibbons, Hare, Hall (if much were absorbed), Howard, Hammond, Griffith, Kingsley, (if sufficient to cause toxic effects), Middleton, North, Parsons, Pendleton, Robinson, Rucker (if in any great quantities), Sweet, Stebbins, Tufts (if in any quantity), Torrence, J. A. Watson, C. K. Cole, and I. A. Watson hold that if lead were thus absorbed it would be objectionable.

Non-committal.—Dr. Simons: This depends upon the quantity.

Negative.—Drs. Brush, Dickinson and Spaulding think absorption would not be sufficient to be objectionable.

7. *Have you not some general comments to offer on A. Ph. A. Query No. 3, "To what extent are official plasters employed in the practice of Pharmacy and Medicine?"*

Dr. Allen: In my experience, both personal and by my immediate colleagues, plasters are but little in use; the results obtained are not important, and their range of application and usefulness seems very limited. Plasters should be made to cover the entire field held by the ointments, should vary in degree of adhesiveness, and should be made of variable degrees permeable to air or moisture.

Dr. Barnes: To my knowledge very few plasters are prescribed; but standard brands are used if any.

Dr. Bigelow: I believe more as a placebo than from actual results obtained.

Dr. Frederick Castle (New York City) makes no reply to the preceding queries, but says: The only plasters that I commonly use are the adhesive ones employed surgically. I have little faith in such as purport to be serviceable otherwise.

Dr. Corson: In my practice I do not use often the official plasters, or any plasters for that matter.

Dr. ——— (Charleston, S. C.): I use a digitalis plaster in renal inadequacy, which I cannot procure in rubber combination. Why is such a plaster not put upon the market similar to belladonna?

Dr. N. S. Davis (Chicago): I do not remember having prescribed a medicated plaster for any patient in twenty years.

Dr. Dickinson: Sometimes desiring a splint effect or to protect from draughts I order

a rubber plaster. If I desire a medicinal effect I order the official plaster. I have no confidence in the non-official belladonna plaster. Rarely have I seen the proper effect obtained from the non-official plaster, yet once in 1879, I had a woman poisoned—"erythema"—by the non-official. I feel disgraced when ordering a non-official preparation of any kind. The A. Ph. A. are supposed to build for the physician, but do so imperfectly and with incompleteness; hence the numerous drug-houses. Is the pharmacist passing into history or becoming a corporation?

Dr. Eagleson: I use plasters very sparingly, only belladonna, capsicum and thapsia. I do not think we get very decided results from them.

Dr. Hare: I believe that plasters are valuable in many cases and are largely employed.

Dr. Kingsley: Ointments with me take the place largely of plasters.

Dr. North: Perhaps plasters are not employed as much as formerly: still I think they are beneficial, both by absorption of the medicine in combination and also by the supporting character of the plaster. In lumbago, for instance, a rubber plaster may benefit by its supporting influence, and in pleurisy a good rubber plaster—belladonna or anodyne plaster—may do good by absorption of anodyne and also by controlling the costal movement. I get benefit from simple rubber plasters.

Dr. Pendleton: Would prefer prescribing a plaster which does not bear the manufacturer's name in form which the patient detects and hence thinks it "patent medicine."

Dr. Stebbins: The rubber-combination plasters are much more cleanly and desirable in every respect.

Dr. J. N. Dixon (Springfield, Ill.): Don't use them.

Dr. H. G. Wetherill (Denver, Colo.): I do not prescribe them.

Dr. Tufts: I do not use great quantities of plasters. When I do, I invariably get satisfactory results from standard ready-made plasters.

Dr. Torrence: I believe that by excluding air and giving a certain amount of mechanical support, nothing further is gained by their use.

Dr. Wood: Plasters, except for blistering, are, in my opinion, of very limited value in practical medicine. When I give an order to an apothecary I expect him to furnish the official article; sending only to first-class druggists, I have not noticed any failure of the supplied plasters to act.

Dr. J. A. Watson: The standard brands give me entire satisfaction.

[A number of physicians, particularly in the large cities, reply that as their practice is confined to treatment of eye, ear, throat, etc., they are not in a position to answer the queries, and a considerable number have not replied at all. Of those who have answered, some have confined their replies to certain of the questions or simply made a brief general statement. As it was necessary to complete paper before April 17th, replies received after that date could not very well be included in the symposium. A few physicians requested that their names be not published, and, as their replies were substantially like the rest, they have been omitted, as the reader could not refer to them for verification if he so desired. The writer has aimed to suppress nothing on either side of any question raised. To save space, the address of each contributor is given but once. This accounts for the irregularity in style toward the latter part of paper when names are introduced for the first time.]

It is evident from the replies received that pharmacists rarely have occasion to make any use of the pharmacopœial plaster formulas. The majority of pharmacists heard from think their physicians are satisfied with the standard brands of manufactured plasters. The majority consider the rubber-combination masses superior to the official. The majority prefer buying plasters ready-made to making them; and again, the

majority think they derive more profit from their total plaster sales now than prior to the introduction of the manufactured rubber-combination plasters. The majority of physicians heard from expect rubber-combination to be dispensed when they order plasters without specifying otherwise. The majority are as well satisfied with standard brands of belladonna plasters, for example, in rubber combination, as with the official, and the majority say they have not failed to get the local effects of belladonna from ready-made belladonna rubber-combination plasters. In cases where failure is reported, the majority ascribe the negative results to deficiency of drug rather than to any defect in the mass, only two holding the contrary view.

As to the absorbability of lead plaster, some physicians think it is absorbed through the unbroken cuticle and more do not; but nearly all agree that, if absorbed, it would be objectionable. The natural conclusion, therefore, is that either the lead plaster combination mass has no advantage over the rubber-combination in the matter of absorbability, or that, if it is more readily absorbable, it is inferior for the reason that absorption of lead is objectionable. A case is reported in the Am. Jour. of Med. Sci. xxiii, p. 246 (U. S. Disp., p. 500), in which lead colic resulted from the long-continued application of lead plaster to a large ulcer of the leg.

The claim that the official mass is less irritating than the rubber-combination finds support in two or three replies; but it is interesting to note that one pharmacist, after making this point, speaks of the wearing of the rubber-combination plasters as "largely a matter of habit, once on always on, and they feel a loss without it." Evidently the great majority of people are not troubled with irritation from the rubber-combination mass. The millions of plasters used without complaint of this kind is pretty conclusive evidence on this point.

The fact that no official plasters have as yet been standardized by the U. S. Pharmacopœia, and that, at least until recently, the majority of manufacturers have failed to standardize their products, accounts for a lack of uniformity and medicinal value in a considerable portion of the plasters sold, which has doubtless injured this class of remedial agents in the estimation of the medical profession.

It is safe to say that plasters are better in every respect now than formerly, and that their sale has very largely increased in the last ten years.

The pharmacist is "chemist to both the medical profession and the public," and not only does the physician require the greatest possible uniformity, but the popular demand for plasters, to relieve minor ailments in which the physician would usually not be consulted, is sufficient in itself to make it desirable that the Pharmacopœia should adopt some practical standards which may provide for greater uniformity in the product of different manufacturers. This much at least, it would seem, the able representatives of the two professions who are to revise our guide-book owe to

the physician and public. Formulas are evidently unnecessary if pharmacists do not use them, as it is clear, from the evidence presented, they do not, at least to any appreciable extent.

Doubtless the great majority of pharmacists will agree with Mr. W. S. Thompson when he says: "no other innovation by the manufacturing pharmacist has been so acceptable to the dispenser as the ready-made plaster." The popular verdict would unquestionably be practically unanimous in favor of the manufactured article. Nearly all will also doubtless agree with Mr. Rapelye that it is a case of the "survival of the fittest."

The Question of Control.—Mr. Ford very properly raises the question of who shall control the situation. The retail pharmacist should unquestionably control, in so far as possible, the quality of the goods he dispenses, and no one has done more to put the means of control in his hands than representatives of manufacturing laboratories who have furnished trustworthy assay processes for his use. The testimony of public analysts is something also upon which he is safe in basing an opinion. Just as the law-abiding citizen favors legislation and surveillance, so the well-meaning manufacturing pharmacist favors the retail pharmacist having all possible means of controlling the quality of manufactured products, and he will heartily co-operate in devising trustworthy methods which will help in bringing about this control by retail pharmacists in the interests of physician, public and the upright manufacturer. Pharmaceutical evolution in the preparation of remedial agents places the natural advantages on the side of the large manufacturer; but the coincident development of pharmaceutical assaying is at the same time placing in the hands of the retail pharmacist a means of controlling quality.

Valuation involves the professional and the scientific as much as production does. The office of pharmaceutical controller is certainly as highly professional as the old-time vocation of the apothecary. Whether the pharmacist of the future is to be known as a drug dealer or a pharmaceutical chemist depends largely upon himself.

Through their local, state and national associations and the pharmaceutical press, pharmacists should be able to aid each other in coming to safe conclusions as to the merits of manufactured products, and, thus informed, they stand before the medical profession and the community as professional men. If Mr. Redsecker and those who think with him that the druggist "bears no more relation to the goods he sells than the grocer does to his canned goods," will reconsider the present conditions of pharmacy, they will probably come to the conclusion that, instead of standing before a commercial wall, they have merely arrived at a professional door, and that they hold the key.

The reading of this paper called forth quite a spirited discussion as to the value of the information furnished, which was participated in by Messrs. Hallberg, Sheppard, Whelpley, Pettit, Remington and Caspari,

and it was finally agreed, on motion of Mr. Whelpley, seconded by Mr. Sheppard, that the author should prepare a summary of the paper, giving the net results of his investigations, for publication in the Proceedings.*

The Chair next called for a paper on "Compound Spirit of Ether and Ethereal Oil," by Geo. W. Boyd, and requested the General Secretary to read it, as the author was not present.

Mr. Caspari presented the paper as follows:

SOME OF THE REASONS WHY COMPOUND SPIRIT OF ETHER AND ETHEREAL OIL DO NOT MERIT SPACE IN THE U. S. PHARMACOPŒIA.

BY GEO. W. BOYD, WASHINGTON, D. C.

Compound spirit of ether as a therapeutic agent is not superior to spirit of ether, and is generally obnoxious to the patient, while spirit of ether is agreeable.

It is a constant source of contention as to which should be dispensed to the laity for Hoffman's Anodyne. When compound spirit of ether is dispensed to the laity for Hoffman's Anodyne, it is invariably returned as not the right medicine. The cause of such confusion is probably due to the fact that spirit of ether is commonly called by the French, Liqueur anodine d'Hoffmann, by the German, Hoffmanns-tropfen, while compound spirit of ether is called Hoffmann's Anodyne by the English and United States authorities; this similarity of names for different preparations constantly leads to confusion and dissatisfaction.

The pharmacopœial test, viz.: Forty drops will render a pint of water milky, is defective, as adulteration with some of the fixed oils will give the same results.

Quotation from Edes' "Therapeutics and Materia Medica," viz.: Unfortunately this rather expensive ingredient (ethereal oil) is often reduced much below the pharmacopœial proportions, or an inferior product substituted for it.

Wm. Schleif, "Materia Medica, Therapeutics, etc." states that castor oil is occasionally added to produce the milky appearance.

Charles Caspari, Jr., "Caspari's Pharmacy," adds that commercial Hoffmann's Anodyne varies greatly in composition and is probably never identical with the official spirit, in fact manufacturers do not claim this to be the case, hence the necessity for discrimination between the two preparations when physicians prescribe compound spirit of ether.

H. A. Hare, "Practical Therapeutics." The writer (H. A. Hare) has experimentally studied very thoroughly the action of the last named ingredient (ethereal oil) and finds:

* The Association having voted at the final general session to rescind the action of the Scientific Section in regard to the paper by Mr. Williams, a summary of the paper became unnecessary, and it is therefore printed in full.— *The General Secretary.*

First. That the belief in heavy oil of wine being the quieting agent in Hoffmann's Anodyne, is fallacious.

Second. The calmative effects of this mixture depend largely on the ether, rather than the oil.

Third. It would seem probable that in Hoffmann's Anodyne we possess an agent in which there are linked together three drugs of undoubted power, each of which successively substitutes the other stimulating the system in the order here named, viz.: ether, alcohol and heavy oil of wine.

During the past year the Health Department of this city undertook to prosecute a number of druggists (under the pure food and drug law) for selling spirit of ether for Hoffmann's Anodyne, claiming substitution, but failing to establish the name Hoffmann's Anodyne as an official name, they failed to convict. Such experiences are very humiliating to pharmacists in general, and also produce an unfavorable impression on the public.

A lecturer on Materia Medica and Therapeutics in one of our medical colleges, annually instructs his class that they need not expect to get what they write for when prescribing compound spirit of ether.

In the brief search I have made for these few points of objection, I have observed that where authors make comment on the medical properties of spirit of ether and compound spirit of ether their uses are identical, but in most instances they lay stress on the fact of frequent adulteration of the compound spirit, and this has a tendency to taint the mind of physicians toward the dispenser.

This preparation tends to lower the standard of pharmacy and affords a ready means of attack for the pharmaceutical critic.

Therefore compound spirit of ether and ethereal oil should be withdrawn from the U. S. Pharmacopœia, and thus remove a most common source of suspicious reflections towards the pharmacist.

The Chair stated that, without objection, the paper would be received.

MR. PETTIT: I am in a section where a considerable German population has recently come in from another portion of the State. Some years ago I dispensed Squibb's compound spirit of ether to a customer of this class, and had it returned to me as not being what they wanted when they asked for Hoffmann's Anodyne, Hoffman's Drops—and I have also been asked for Red Hoffmann's Drops. I am now just dispensing spirit of ether in such cases, except when they call for the red drops, and then I simply color the spirit of ether a little and give it to them.

MR. HALLBERG: Red drops are what is commonly known as golden tincture made by the common formula of equal volumes of alcohol, ether and water, colored with tumeric and alkanet. The original form in which what is popularly known as Hoffmann's Anodyne was put up, was a colorless preparation, with a small strip of gold foil in the bottle.

MR. CASPARI: As Mr. Pettit has stated, the German element does not recognize our official preparation. The German Pharmacopœia formerly recognized spirit of ether under

the name of Hoffmann's Anodyne. Our Pharmacopœia recognizes compound spirit of ether as Hoffmann's Anodye.

As to the question of the quality of commercial Hoffmann's Anodyne, I think it is recognized by all that for years the manufacturers have followed an arbitrary standard. I corresponded with a number of manufacturing chemists of this country some years ago, and I received as many different answers as I had correspondents, each one following a different standard. The value of the compound spirit of ether will have to be designated by the physicians.

We know very well that the confusion in sections where there is a German and English-speaking element, is great. I think whenever the apothecary in this country receives a prescription from the physician calling for compound spirit of ether he has no right to dispense what is commercially known as Hoffmann's Anodyne. But the desirability of excluding it entirely from the Pharmacopœia scarcely seems within the province of pharmaceutical discussion; it should be delegated wholly to the physicians.

Mr. Remington: I do not want to anticipate the action of the Pharmacopœia Committee, but while this seems to be a very small matter, it is one of great interest. I think the whole question can be settled in the next Pharmacopœia very happily by making spirit of ether Hoffmann's Anodyne, and compound spirit of ether compound spirit of ether. Then the people who want Hoffmann's Anodyne can get it, and the doctor who wants compound spirit of ether can name it and get it.

The Chairman: The paper will take the usual course, if there is no objection.

The next paper, by J. O. Schlotterbeck, upon "The Nature of Commercial Sanguinarine Nitrate," was presented by the author in abstract, the full text being as follows:

THE NATURE OF COMMERCIAL SANGUINARINE NITRATE,

BY J. O. SCHLOTTERBECK.

According to the most recent scientific literature, sanguinarine is a white crystalline alkaloid, contained in sanguinaria and in a few related plants, whose salts are blood-red in color. In our work on Bocconia cordata we encountered a base that was nearly white in the impure state which became bright red upon the addition of acids. As there is no other alkaloid which possesses this remarkable property, we felt safe in claiming that we had found the alkaloid sanguinarine. As the separation and purification of the alkaloids obtained from Bocconia progressed, we found it impossible to isolate the pure alkaloid sanguinarine, either because of the minute quantity present, or because of possible decomposition during manipulation. As it was desired to learn more of the nature of this highly interesting alkaloid, and as there was no more of the rhizome of Bocconia to be had for another year, it was deemed advisable and unobjectionable to separate it from sanguinaria, which is supposed to contain it in large quantity. Our first impulse was to extract the rhizome, but as concentrated preparations, such as fluid extracts and extracts, can be obtained from manufacturers, we decided to recover the alkaloid from the extract, which was claimed to con-

tain, by assay, all the way from 8 to 17 per cent. of sanguinarine. A pound of the extract ought to contain, therefore, from 40 to 80 grams of alkaloid.

Two pounds of the extract were treated by several methods for the extraction of the alkaloids, and to our astonishment the yield was less than 1 per cent., showing that decomposition had probably taken place during evaporation of the extract.

Attention was then turned to the commercial alkaloidal product of sanguinaria, called sanguinarine nitrate, which is offered by several manufacturers. Three different specimens were secured for the recovery of the free alkaloid sanguinarine. All were in powder form and varied in color from an orange-red to a dull terra cotta. In cold water they were only slightly soluble, but they colored the liquid distinctly. Boiling water dissolved them quite readily, from which they separated again on cooling. Boiling alcohol dissolved them almost completely to a transparent, deeply colored solution.

A quantity was dissolved in hot water, cooled to just the precipitating point, and then made alkaline with ammonia water. The alkaloid was precipitated in the form of a violet colored curd. Since the pure alkaloid is colorless, this violet color at once indicated impurity. The precipitated alkaloid as shaken with three portions of ether, the ethereal solutions combined and filtered. The ether solution was decidedly fluorescent (blue) and of a light red color. This fluorescence, we have learned, is due to a coloring matter or decomposition product of one or more of the alkaloids, and is not a property of the pure alkaloid itself.* A voluminous, almost black precipitate separates and collects between the ethereal and aqueous layers.

The ethereal solution was then filtered, shaken out with water acidulated with acetic acid, and the acid, aqueous solution again precipitated with ammonia water. This cycle of manipulations was repeated for at least ten times, or until the precipitate of free alkaloid was nearly white. The final precipitate was again dissolved in ether and the ether removed by slow evaporation. It was noticed that as a higher state of purity of the alkaloid was obtained, the fluorescence gradually disappeared, as well as the reddish tint, which is very persistent.

The residue from the ether solution was taken up with a very small quantity of chloroform, in which the alkaloid is very soluble, a mixture of acetic ether and alcohol added, and then set aside to crystallize. This was found to be a very excellent crystallizing medium, since the alkaloid is not very soluble in cold alcohol, but freely so in acetic ether. As the acetic ether slowly evaporates, the alkaloid is gradually thrown out of solution in the form of crystals.

The first crop of crystals was pinkish in color, but by many recrystalli-

* Murrill and Schlotterbeck. The Alkaloids of Bocconia cordata, p. 128.

zations they were obtained pure white. It was found necessary to dry them in an atmosphere of ammonia, or to wash previously with a few drops of ether containing a very small amount of ammonia to prevent them from becoming colored in the air.

The free alkaloid was converted into the sulphate and nitrate, but instead of forming blood red salts they became bright lemon yellow. As the names are understood among chemists this is chelerythrine and not sanguiniarine.

The mother liquors were united and more chelerythrine and small traces of protopine and β-homochelidonine separated and identified. After treating the other two samples of sanguinarine nitrate in precisely the same manner, it can be said that the commercial article is either a nearly pure chelerythrine or a mixture of all the alkaloids of Sanguinaria with greater or less amount of decomposition products.

The unfortunate confusion which has arisen in regard to the use of the names sanguinarine and chelerythrine and the various substances designated by the names renders necessary at this point a review of the results of earlier workers.

As the names have adjusted themselves, sanguinarine is applied to the chemical individual of the formula $C_{20}H_{15}NO_4 + H_2O$, a colorless alkaloid yielding scarlet or blood-red salts; while chelerythrine is restricted to the methyl derivative of sanguinarine, a colorless base yielding lemon-yellow salts.

The name sanguinarine was first applied in 1819 to the mixture of alkaloids obtained from Sanguinaria by Dana.* He believed that he was working with a single individual, but later results showed that his product was a mixture of chelerythrine, with smaller amounts of sanguinarine β- and γ-homochelidonine. Whatever the mixture may have consisted of, we must not lose sight of the fact that his sanguinarine possessed the remarkable and striking characteristic of forming blood-red salts.

The name chelerythrine was first applied in 1839 by Probst † to one of two bases which he separated from Chelidonium majus "on account of the intensely red color of its salts." In the same year he also prepared his chelerythrine from Glaucium luteum, and also prepared Dana's sanguinarine from Sanguinaria. From these researches he decided that the two substances were identical.

In 1843 Schiel ‡ continued work along this line, and in 1856 published an article § holding the identity of chelerythrine and sanguinarine both in composition and properties.

---

* Mag. f. Pharm. *23*, 125; Annals Lyc., N. Y., *2*, 245.

† Ann. Pharm. (Liebig), *29*, 120; *31*, 241.

‡ Ann. Pharm. (Liebig), *43*, 235.

§ Journ. prakt. Chem., *67*, 61.

The first mention of attempts to obtain crystals is by Naschold,* in 1869, who obtained sanguinarine (?) from alcohol in "warts, or warty masses, or transparent needles," and reports the melting point 160–5°.

From the laboratory of E. Schmidt comes the most recent work, where, for the first time, the compounds were obtained pure.

After it was quite conclusively proven that sanguinarine and chelerythrine as originally applied were identical, König † retains the name sanguinarine for the red salt-forming alkaloid, and applies the name chelerythrine to the yellow salt-forming alkaloid. This has added greatly to the confusion which already existed. As for the name itself, it is etymologically incorrect to apply the name chelerythrine to a yellow body.

The writer believes that the name sanguinarine should be applied to the predominating alkaloid of sanguinaria, which is the yellow salt-forming one. From etymological reasons the name sanguinarine may appear just as objectionable as chelerythrine, since it may be used to mean blood-like, but this objection does not hold good, for the reason that the name is derived from sanguinaria and not from sanguis. Had the predominating alkaloid been a white salt-forming one, it would also have received the name sanguinarine according to the custom in naming constituents.

Since sanguinarine nitrate is being used more and more in preparations used by the practicing profession, and as it represents the activity of the drug to a marked degree, it may be entitled to a position in the next United States Pharmacopœia. No better way can harmony be brought out of this confusion which exists in the nomenclature of this substance than by its description in the Pharmacopœia.

THE CHAIRMAN: Without objection, the paper will be received, and is now open for discussion.

MR. SAYRE: I consider these investigations very valuable, indeed, and have listened to the reading of this paper regarding the constitution of sanguinaria and chelidonium with a good deal of interest. The question arises in my mind as to the relative value of these two alkaloids, sanguinarine and chelerythrine, physiologically. Referring not only to this paper, but to that of the same author on Bocconia cordata, read day before yesterday, I would like to ask whether any physiological experiments have been performed with reference to these alkaloids?

MR. SCHLOTTERBECK: No experiments have been performed physiologically, because we have not succeeded in separating the alkaloids absolutely. Further referring to this subject I may say that in sanguinaria and related drugs there is a coloring matter which may have something to do with this crimson color referred to. The further we purify them the more chelerythrine we get If sanguinarine is present, it is in small quantities, and that is the reason we are growing such large quantities of bocconia in the University gardens, with the view of seeing if we cannot separate the sanguinarine.

---

* Journ. prakt. Chem., *106*, 385. This was doubtless the yellow body.

† Ztschr. f. Naturw. *63*, 639; Chem. Centrbl,, 1891, i, 322.

MR. SAYRE: I believe you said that it was possible to obtain protopine in large quantities from bocconia?

MR. SCHLOTTERBECK: Yes, sir. In sanguinaria, however, there is very little protopine, and I would never resort to sanguinaria to recover protopine on a large scale. It is present in it in small quantities, not more than one per cent. of total alkaloids, almost all the balance being chelerythrine.

MR. LYONS: We have here a very interesting question of nomenclature. It would seem that the name "sanguinarine" was first appropriately applied to a mixture of alkaloids derived from sanguinaria, which later investigations show to consist essentially of the alkaloid subsequently discovered in another plant, and named inappropriately "chelerythrine." We have the same sort of difficulty in our botanical and zoological names. The principle is that the oldest name holds. It is true that the sanguinarine first prepared was contaminated with other alkaloids, but it seems to me clear that, under the law just stated, that name must stand as that of the active principle of blood-root. Moreover, it is in common use commercially and among physicians, and it is self-explanatory.

MR. STEVENS: If the name is to be changed at all, it would certainly seem that now is the time to change it. The time will come when these alkaloids will be prescribed as such without the name of the root.

THE CHAIRMAN: Without objection, the paper will take the usual course.

The Chair stated that a request had been preferred by the President of the Association, Mr. Prescott, to suspend this session of the Scientific Section for a few moments, in order that the general Association might have a short business session, and, upon motion of Mr. Whelpley, it was so ordered.

The Section resumed its session after a recess of a few minutes.

THE CHAIRMAN: Before proceeding with the further reading of papers, I should like to ask that the regular order be dispensed with, in order that the committee reports may be received at this time.

MR. WHELPLEY: I make a motion to that effect.

The motion was seconded and adopted.

The Chair called for the Report of the Committee on Chairman's Address, and Mr. Stewart read the report as follows;

We commend the able address of the Chairman of the Section to the careful consideration of the members of the Association. The subject matters are general in character, however. We report favorably in relation to the one recommendation made in it that a Committee be appointed to address the Secretary of Agriculture, recommending the instituting of experiments in the cultivation of medicinal plants, with the object of increasing their value.

F. E. STEWART,
J. M. GOOD,
A. B. STEVENS.

Upon motion of Mr. Oldberg, the report was adopted.

THE CHAIRMAN: I appoint as a Committee to address the Secretary of Agriculture, in accordance with the recommendation of the report, Messrs. H. H. Rusby, Henry Kraemer and David M. R. Culbreth.

The next report is that of the Committee on Revision of United States Pharmacopœia.

Mr. Stedem read the report as follows:

REPORT OF COMMITTEE ON THE REVISION OF THE UNITED STATES PHARMACOPŒIA.

To the Officers and Members of the American Pharmaceutical Association:

Your Committee desires to report as follows:

The decennial meeting of the Pharmacopœial Convention, which has just been held, necessarily shortens our report at this time, and we submit the following for your consideration:

Chlorine Water.—An alternative substitute formula for chlorine water is desirable. The official water lacks stability, and it is inconvenient to make in many drug stores, hence it would be desirable to have an official substitute formula, directing the use of potassium chlorate, hydrochloric acid and water.

Carbolic Acid.—It is stated that alcohol is an antidote for carbolic acid. If this be so, and in view of the fact that this article is a commonly kept household antiseptic, would it not be well to recommend a 25 per cent. solution in alcohol, to be known and dispensed as "household carbolic acid?" Such household carbolic acid would at least not cause death if swallowed either by accident or intent.

Saturated Solutions.—The Pharmacopœia gives solubilities of the various salts in water, yet it is deemed desirable to give exact working formulas of such solutions as are frequently prescribed. Among the more important and frequently prescribed salts in saturated solutions are: Potassium iodide, ammonium chloride, potassium chlorate and boric acid.

LEO ELIEL, *Chairman.*

Mr. Oldberg moved that this paper be referred to the Committee on Revision. Carried.

THE CHAIRMAN: The Report of the Committee on Revision of the Pharmacopœia mentions alcohol as an antidote for carbolic acid poisoning. We have a paper by Mr. Howell on this subject, and as he is not present I will ask Mr. Whelpley to read it.

Mr. Whelpley presented the paper as follows:

ON ALCOHOL AS AN ANTIDOTE FOR CARBOLIC ACID POISONING.

BY E. V. HOWELL, CHAPEL HILL, N. C.

Recently, in the "Bulletin of Pharmacy," mention has been made of the use of alcohol as an antidote for carbolic acid poisoning. Attention I believe was called to the fact of the recovery of a patient who had taken this poison and then a large amount of whiskey. Now, if alcohol is to act as an antidote to the poison, it should

(1) Neutralize or modify the caustic effect of the acid.

(2) It should modify or counteract the internal effect, causing delirium, coma or collapse.

(3) It must be capable of doing this in either a sufficiently small or sufficiently diluted form.

Experiments were tried only in regard to its counteracting the caustic effect. Those in regard to the dilution of it and allowing to remain in the system will be tried later.

(1) A solution of 5 Cc. of carbolic acid in 10 Cc. of alcohol was applied to the skin. Skin turned white, burning sensation. In a more diluted form this action is greatly retarded.

The skin was rubbed with cotton saturated with 95 per cent. alcohol. White disappears, the skin turns red, and the burning sensation stops.

(2) A solution of 10 Cc. of acid in 10 Cc. alcohol applied to the skin. Skin white, burning senation. Alcohol (95 per cent.) applied, stops burning and changes the white to red.

This tends to show that we may consider the effect of alcohol one of dilution.

(3) 10 Cc. carbolic acid in 10 Cc. alcohol. A mouthful taken, spit out, mouth rinsed with 95 per cent. alcohol and then with water.

Effects.—Mouth and tongue white, burning sensation; alcohol removed both, and the effect of alcohol passed away in a few minutes, and no bad effect was afterwards experienced.

(4) Several drops of the strong acid placed on tongue. The whiteness of the tongue and the burning were removed by the use of 95 per cent. alcohol.

(5) Several drops were placed on tongue. The whiteness and burning were removed by the use of 50 per cent. alcohol. Required more, and the action was slower.

This leads up to the suggestions:

(1) That alcohol modifies or counteracts the caustic effect of carbolic acid.

(2) That in cases of poisoning by internal use it might be used to dilute the acid, and allow the use of the stomach pump with good results.

(3) When carbolic acid is used for small surgical operations alcohol might be used to restore the color of the tissues after they have been benumbed by carbolic acid.

(4) That the tissues of mouth would seem to be so much more sensitive, yet they give perhaps even better results with the alcohol treatment than the skin on the forearm.

(5) A few drops of creosote put on tongue. The white color was removed with alcohol.

THE CHAIRMAN: Are there any remarks on the paper?

MR. LYONS: In connection with this subject I would say that, inasmuch as carbolic acid is both used as a poison and becomes a poison by accidental use, the matter of antidote is one of special interest, and it occurs to me that it may not be generally known how antagonistic the action of camphor is to carbolic acid. I think it would be a good idea to take this subject up as a special study. A mixture of equal parts of camphor and carbolic acid has no caustic effect whatever.

MR. STEWART: I wish to call the attention of those interested in the subject to the fact that in *Merck's Archives* for 1898 were summarized all the reports on alcohol as an antidote for carbolic acid, both externally and internally used. The claims made are quite remarkable, but whether the experiments will prove them to be correct remains to be seen. The claim is made for alcohol as an antidote for carbolic acid taken internally, and a number of cases are reported indicating that to be true.

MR. WHELPLEY: I believe experiments along these lines have been taken up by some of the manufacturers on a large scale—with carbolic acid and camphor, I believe, or carbolic acid and alcohol.

MR. HALLBERG: I am very much interested in this question of antidotes for carbolic acid poisoning, and would move that this Association recommend to the pharmacists of the country that they restrict the sale of carbolic acid for domestic purposes to a 25 per cent. alcoholic solution, as recommended by the Committee on Revision of the Pharmacopœia. I believe that if this Association will recommend that, that a great many pharmacists will have their attention called to it and that they will be glad to follow this suggestion. If introduced into the Pharmacopœia, they will have to wait several years for it, and I believe that this form cannot be adopted too quickly; therefore, I would offer this as a motion. We might also make the suggestion as to other antidotes, if necessary, to be provided for on the label, such as to be followed by a solution of glauber salts, or something of that kind. The general impression is—and even in some of our leading text books the statement is made—that oil is the proper thing to use as an antidote for carbolic acid, but whenever that is used of course the effects are exceedingly serious. I believe we ought to consider any method that promises to stop or modify the wholesale poisoning that is going on by means of carbolic acid.

Mr. Stedem seconded the motion of Mr. Hallberg.

MR. SAYRE: I think the addition of glycerin to the alcohol would add to its value. We all know how careless people are in the handling of carbolic acid. I have seen bottles about the house without any stoppers in them. I have known some very serious accidents to happen from the careless handling of carbolic acid in this way. In one case that I recall a thumb had to be amputated; not only the epidermis, but the dermis was injured. The child went to bed, and in the morning it was dead. The tissue was destroyed. I think this is a serious question, and I hope you will not limit this to a purely alcoholic solution. I think we should study this question, and recommend to the public what is the best way to handle this thing.

THE CHAIRMAN: The motion is, that this Section recommend to the pharmacists of the country that carbolic acid be dispensed in 25 per cent. alcoholic solution.

And the motion was so put and carried.

THE CHAIRMAN: We have a paper here by Mr. Geo. E. Barksdale, on "The Cerate of the Extract of Cantharides," which will be read by title and referred, if there is no objection. We have also a paper by Mr. Alpers, which he has asked to have read by title—a "New Formula for Aromatic Spirit of Ammonia."

The full text of said papers was as follows:

THE CERATE OF THE EXTRACT OF CANTHARIDES.

BY GEORGE E. BARKSDALE.

The Pharmacopœia of 1890 is wanting in a prompt, sure and efficient blistering agent, save cantharidal collodion, to which numerous objections

can be cited, the principal one being the inability to remove it readily after its purpose is accomplished, and also the fact that after the vesicle is formed, should the cuticle be ruptured, the sudden exposure of the delicate nerve endings to the effect of the collodion produces so much pain and irritation that the patient is scarcely likely to forget the experience, but is most likely to strenuously object to such procedure. The Cantharides paper of 1880 had no advantage over the plaster made from the cerate, and since it was a great deal weaker and intended principally as a rubefacient, it may not be considered.

Thus, the physician is left without a preparation which, when needed, a prompt effect is the one desirable aim, and it certainly behooves the pharmacist to place in his hands an effective and standard remedy that can be absolutely depended upon, and whose requirements of therapeutic activity shall as definitely have been ascertained as the alkaloidal strength of certain tinctures even if resort must be had to physiological tests.

It is a truly provoking dilemma to find oneself in, and absolutely disheartening to have a messenger bring a nicely spread blister, in the mechanical perfection of which the dispenser has particularly prided himself, and to hand it over, saying, "the doctor said this plaster is of no account, and says send a fresh one," or in a fit of displeasure at the delay, delivers a part of the message and departs to your competitor to have the prescription compounded and continue to do so, mentally declaring so and so to carry worthless drugs.

Or, possibly, the physician himself approaches the dispenser with, "I say, Mr. Smith, what do you think is the matter with this blister I ordered yesterday? I told the patient to have it kept on until it produced a blister, and I find this morning that the skin is scarcely reddened, and it has been on now nearly twenty-four hours. Haven't you some fresh cerate or a better plaster than this? I was particularly anxious to produce a rapid blister on this patient, and you see the result."

To all of which the dispenser timidly asks, "Did the nurse wash the skin well with soap and water and alcohol or vinegar?" to which he is most certain to have an affirmative reply. Then he candidly admits, "I am sure I cannot account for its failure to produce the desired effect. I know the cerate to be fresh, for I made it myself." Aye, truly, but the fault lay in the preparation fundamentally, and not in the method of its preparation, or the dispenser.

It is a mooted point among physicians as to when vesication should be done in a disease like pneumonia. Many claim that only a blister is indicated in the first stage, and since this change occurs and merges into the second stage in a few hours, frequently, unless the remedy is prompt the vesicant might, and most likely will, do harm.

For some reason best known to the revisers of the Pharmacopœia of 1890, the cerate of the extract of cantharides was dismissed, as was the

cantharidal paper, and the U. S. Dispensatory, in commenting upon this dismissal, says in a foot note that it is very properly so. It is a great pity that so high an authority should concur in the dismissal of a preparation that even on general principles is much more to be desired than the slow acting and most disappointing plaster of the cerate.

It is a significant fact that the cerate was modified in the 1890 edition by the addition of oil of turpentine, this in itself proving the untrustworthiness of the preparation.

The addition of the turpentine is presumably for the purpose of dissolving the canthardin, but as this is by no means the best solvent for the principle, why is it used in preference to some other?

Cantharidin is considered the vesicating agent, yet it is well known that an aqueous solution of the flies or the extract will produce a vesicle, and still cantharidin is only slightly soluble in water. To test the vesicating properly, the writer made some cerate of the extract, with chloroform as a menstruum, of the identical strength as that of the 1880 Pharmacopœia; the plaster was applied and remained three hours without the least effect. He then used ether as a menstruum, preparing the cerate as before; a plaster was spread and applied, and remained on for three hours; still no effect. No preparation of the skin was made whatever beforehand. Chloroform and ether are thus accounted the best solvents for the cantharidin, and nevertheless the cerate prepared by using them as menstruum is a failure.

Therefore, we must come to the conclusion that the cantharidin itself, while being practically insoluble in water, and possessing vesicating properties, must exist in some combination, which combination likewise has vesicating properties, and is soluble in water and alcohol; and since this is the case if chloroform or ether is used to dissolve the cantharidin, it in turn in the cerate may not be dissolved, and so act upon the skin to produce the vesicle, although such result may take place with the preparation made by exhaustion with alcohol or water.

It has been amply demonstrated by Proctor and others that flies treated and exhausted as far as possible with water and alcohol, still contain a considerable quantity of cantharidin, as much as .822 per cent., according to Greenish.

Since all of the present working formulæ for the preparation of an effective vesicating plaster are defective, we must needs look for some better method of extracting the principle from the cantharides and of properly incorporating it with some medium, so that a more prompt and certain effect is produced.

Now cantharides being of animal origin, it is almost useless to remember that they are prone to be attacked by fungi and insects, and therefore it is highly essential that the flies be kept whole and in tight receptacles, care being first taken to add a few drops of carbon disulphide to prevent infection by insects.

While the writer has scarcely had the opportunity to make the necessary investigations with cerate made by several methods, except those already mentioned, yet he believes that if the cantharides are freshly powdered and the cerate prepared according to the formula of the United States Pharmacopœia, 1880, and then an acetous extract of the cantharides in quantity the same as for the cerate of the extract of 1880 be incorporated with it, including in the formula sufficient camphor to prevent strangury of the kidneys, it is quite possible to effect vesication in a much shorter time than it has taken hitherto. The fault in the cerate of 1890 is the powdered flies are too coarse, being directed in No. 60 powder, while it would undoubtedly be more effective in an unprepared powder.

Not only should the cerate be sufficiently high in percentage strength of extract and cantharides, but a physiological test should be made of the cerate, and note should be made of the time necessary to produce a blister, so that some dependence could be placed on the preparation.

Richmond, Va., April, 1900.

NEW FORMULA FOR AROMATIC SPIRIT OF AMMONIA.

BY WILLIAM C. ALPERS.

In 1898 the writer submitted a paper on Aromatic Spirit of Ammonia to the New Jersey Pharmaceutical Association, in which he recommended the use of stronger water of ammonia in place of the carbonate and water of ammonia, as now official. The complaints about the difficulties of obtaining a carbonate that will answer all the requirements of the Pharmacopœia are well known, and the above suggestion was made with a view of overcoming these difficulties.

The following arguments were used in compiling the new formula:

Sufficient quantities of normal sulphuric acid are taken to neutralize both the ammonium carbonate and the water of ammonia in the official formula, and a corresponding quantity of stronger water of ammonia—that is to say, a quantity which would be neutralized by the same amount of normal sulphuric acid—is then calculated, and recommended in the place of the two ingredients.

The official formula requires thirty-four grammes of ammonium carbonate; 2.613 grammes require, for exact neutralization, 50 Cc. of normal sulphuric acid. Therefore, 34 grammes require $\frac{50 \times 34}{2.613}$ Cc. equal to 650.593 Cc. of normal sulphuric acid.

Further, there are 90 Cc. of water of ammonia in the official formula; 3.54 Cc. require, for exact neutralization, 20 Cc. of normal sulphuric acid. Hence, 90 Cc. require $\frac{20 \times 90}{3.54}$ Cc., equal to 508.477 Cc. of normal sulphuric acid.

Both ingredients, therefore, require 650.593 plus 508.477, equal to 1159.070 Cc. of normal sulphuric acid.

Further, 1.88 Cc. of stronger water of ammonia require, for neutralization, 28 Cc. of normal sulphuric acid. Therefore, the quantity of stronger water of ammonia which would be neutralized by the amount of normal sulphuric acid calculated before, would be $\frac{1159.070 \times 1.88}{28}$ equal to 77.823 Cc. of stronger water of ammonia. This quantity would, therefore, be the equivalent of both the ammonium carbonate and the water of ammonia necessary to make 1000 Cc. of aromatic spirit of ammonia.

The stronger water of ammonia is easily tested by titrating with sulphuric acid or by taking its density, and the pharmacist is therefore not depending on such an unreliable article as the carbonate. Considering that the latter is almost always of inferior strength, the calculated amount of stronger water of ammonia, namely, 77.823 Cc. can safely be reduced to 75 Cc., and based on the preceding arguments the following new formula is proposed:

Stronger water of ammonia	75 Cc.
Alcohol	725 Cc.
Oil of lemon	10 Cc.
Oil of lavender flowers	1 Cc.
Oil of nutmeg	1 Cc.
Distilled water sufficient to make	1000 Cc.

Let stand for a few days and filter.

Aromatic spirit of ammonia, if made in this way, is colorless, or of a light straw yellow color, according to the oils used, and gradually turns a little darker. 10 Cc. of it are neutralized by 11.17 Cc. of normal sulphuric acid.

The next paper presented was by Mr. J. O. Schlotterbeck, on "Adlumia Cirrhosa, a New Protopine-bearing Plant," and Mr. Schlotterbeck read the paper in abstract, the full text of the paper being as follows:

ADLUMIA CIRRHOSA, A NEW PROTOPINE-BEARING PLANT.

BY J. O. SCHLOTTERBECK.

Adlumia cirrhosa, which is variously known as Alleghany vine, mountain fringe and climbing fumitory, is a delicate vine, climbing by its slender young leaf-stalks over high bushes in wet woods from New England to Michigan, Eastern Kansas and southward. It is also largely cultivated in gardens because of its beautiful, finely-cut foliage. It is a member of De Candolle's Fumariaceæ, a family so closely related to the Papaveraceæ that modern systematists have agreed that it more properly occupies the position of a tribe of the latter family.

Since all plants of the Papaveraceæ, as far as they have been studied, are alkaloid-bearing, one would be reasonably safe in assuming that all other plants of this family contain one or more alkaloids. Indeed, it would seem strange if we should encounter a plant of this family that would fail to respond liberally to the tests for alkaloids. This process

of reasoning led me to take up the chemical study of the above-named plant.

For this investigation the plant, which is a biennial, was collected in the fall of the first year's growth from the botanical garden of the University of Michigan. The roots were dug, washed, separated from the leaves and stems, and carefully dried with the aid of artificial heat. Of the thoroughly dried root, which was ground to a No. 40 powder, 10 grams were macerated 24 hours in a closed flask with 100 Cc. modified Prollius fluid. About 10 Cc. of the filtered fluid were then evaporated to dryness on the water-bath, and the residue taken up with several small portions of water acidulated with acetic acid. The filtrate gave abundant precipitates with Mayer's and Wagner's reagent and with ammonia water, thus indicating the presence of alkaloids. The approximate yield was estimated gravimetrically with 25 Cc. of the Prollius extract, and was found to be about 1 per cent. The leaves contained very much less.

In order to learn more of the properties of the alkaloidal substance, 100 grams of the powdered root were thoroughly moistened with ammonia water to liberate the alkaloids from their combinations, then carefully and thoroughly dried in a current of warm air and completely exhausted in a Soxhlet apparatus with chloroform. The percolate was subjected to distillation for the recovery of the chloroform, and the residue treated with several portions of water acidulated with acetic acid. This was done upon the water-bath in order to insure the complete extraction of the alkaloid, which is more or less mechanically held by the sticky residue. The combined extracts were cooled, filtered, placed in a separatory funnel, and made alkaline with ammonia water. A voluminous, almost white precipitate, which assumed the character of a curd, was thrown out. This was shaken with ether, whereupon the precipitate at once went into solution. This solution was only temporary, however, for from the filtered ether solution the alkaloid began to separate almost immediately in the form of white warts or sphæro-crystals, and in a few minutes practically all of the alkaloid had separated.

For the purpose of purification the alkaloid was taken up with dilute acetic acid, reprecipitated with ammonia water, shaken with ether, rapidly separated and filtered, and set aside to crystallize. This operation was repeated until a practically constant melting-point was obtained. After recrystallizing several times, finally from acetic ether a melting-point of 203° (uncor.), 207° (corr.) was obtained.

This alkaloid is very insoluble in petroleum ether, practically insoluble in water, and in absolute alcohol, and but slightly soluble in ether when it is in the crystalline state. When freshly precipitated from solutions of its salts by means of ammonia water, however, it is, as shown above, temporarily very soluble in ether. Its best solvent is chloroform. Being but very slightly soluble in absolute alcohol and very soluble in chloroform, a mix-

ture of these forms an excellent medium from which the alkaloid may be easily obtained in beautiful prismatic crystals. It possesses the peculiar property of crystallizing in two different forms, viz.: in warts, or in single prisms of the monoclinic system. Depending usually upon change of solvents, one crystalline form can be converted into the other. Even from the same solvents, as from ether or from alcohol, both forms are produced simultaneously.

The chloroplatinate forms dark yellow sphæro-crystals, while the chloroaurate forms tufts of needle-like crystals. Concentrated sulphuric acid gives mometarily with a small quantity of the alkaloid a red color, but this is immediately followed by a deep violet. Concentrated nitric acid dissolves it in the cold without color, but upon warming becomes red. Erdman's reagent turns it deep violet-blue at once.

Although sufficient quantity of the alkaloid was not at hand to make combustions, enough of its properties have been determined to enable its positive identification. In its crystalline form, solubilities in the crystalline and freshly precipitated states, melting point, color reactions, and crystalline forms of its chloride, sulphate, chloroplatinate, and chloroaurate, it agrees exactly with the protopine, which we have separated from Bocconia cordata,[1] and with a specimen of protopine from opium.

The formula as determined by Hesse[2] and by Eijkman,[3] is $C_{20}H_{19}NO_5$. Selle,[4] Koenig and Dietz[5] obtained results which agree better with the formula $C_{20}H_{17}NO_5$. In spite of this small discrepancy, which is likely to occur with different operators, we are justified in asserting that the alkaloid which these investigators have investigated is in each case protopine. The conclusions as to the identity of the alkaloid of Adlumia cirrhosa is based upon the very characteristic properties above mentioned, and upon the fact that it is identical with the protopine, which we have separated from Bocconia cordata.

While collecting the literature upon this subject the striking similarity of the physical properties of protopine, which is the most frequently occurring alkaloid in the Papaveraceæ, with those of fumarine, which is the alkaloid of most frequent occurrence in the Fumariaceæ, was noticed. An excellent opportunity for comparing these two bodies was offered in the study of Bocconia and Adlumia, which was going on in this laboratory at the same time. A specimen of fumarine separated from Fumaria officinalis by P. F. Trowbridge, was also kindly placed at the disposal of the writer for additional comparative study. The composition of the alkaloid from two of these sources was not determined because of scarcity of material, but in physical properties they agreed in every particular. Fumarine is therefore probably identical with protopine.

[1] Murrill and Schlotterbeck, Proc. A. Ph. A., 1900, p. 128.

[2] Annal. Chemie, Suppl., *8*, 318.

[3] Rec. Trav. Chim., *5*, 182.

[4] Arch. Pharm., *228*, 441.

[5] Arch. Pharm., *231*, 145.

Protopine has been found in Papaver somniferum,[1] Bocconia cordata,[2] Chelidonium majus,[3] Escholtzia californica,[4] Sanguinaria canadensis,[5] Stylophorum diphyllum,[6] and Adlumia cirrhosa.[7]

Fumarine has been reported in Fumaria officinalis at different times by Peschier[8], Hannon,[9] Preuss,[10] and Reichwald.[11] Battandier[12] found it in Glaucium corniculatum and in six or more genera of the Fumariaceæ. Later he isolated it from Bocconia frutescens.

Since Fumarine was discovered and named long before its discovery in opium by Hesse, it is but proper that the name protopine be dropped entirely.

From the above it is seen that the alkaloid in question occurs in a greater number of plants than any other known alkaloid.

School of Pharmacy, Ann Arbor, Mich.

Mr. Schlotterbeck's presentation of his subject was greeted with applause.

Mr. Sayre: I want to express my gratitude to the author of this paper for this important work of his. I have followed it with considerable interest, and have been greatly pleased with its progress. I should like to suggest, however, that I do not think he can successfully argue one point he has made here, that *fumariaceæ* and *papaveraceæ* belong essentially to the same order. If he will permit the suggestion, I do not think that position can be positively maintained. That there is much resemblance between the two natural orders is true, but there is sufficient distinction between them to support what some botanists claim—that they are different orders.

Mr. Schlotterbeck: In reply to Mr. Sayre, I will say that the botanists have already united these two orders.

The Chairman: I have received a paper which the Chair does not feel authorized to present to the Section without its consent, because he has not been able to read it. It has just been put in his hands. If the Section so desires, the paper can be read, but the Chairman cannot assume responsibility for it. The paper is by Mr. Joseph W. England, and the title is, "The Pharmacopœial Recognition of Diphtheria Antitoxin."

On motion of Mr. Prescott, it was ordered that the paper be read, and the author presented it as follows:

[1] Hesse, Annal. Chemie, Suppl., *8*, 318.

[2] Eijkman, Rec. Trav. Chim., *3*, 182; Pharm. J. Trans., [3], *13*, 87; Murrill and Schlotterbeck, Proc. A. Ph. A., 1900, p. 128.

[3] Selle, Arch. Pharm., *228*, 441.

[4] Dankwortt, Inaug. Dissert. Erlangen, 1890.

[5] Koenig and Dietz, Arch. Pharm., *231*, 145.

[6] Selle, Arch. Pharm., *228*, 96. [7] Schlotterbeck, Proc. A. Ph. A., 1900, p. 267.

[8] Jahresber, Fortschr. physis. Wiss., 1832, 245.

[9] Jahresber, Fortschr. physis. Wiss., 1852, 550.

[10] Zeitsch. f. Chem. (Beilstein, Fittig, Hübner), 1866, *2*, 414.

[11] Russ. Zeitsch. Pharm., *28*, 161. [12] Compt. Rend., *114*, 1122; *120*, 1276.

ON THE PHARMACOPŒIAL RECOGNITION OF DIPHTHERIA ANTITOXIN.

BY JOSEPH W. ENGLAND.

There is no fact in clinical medicine more clearly established than that the human body has within it natural resources for combatting disease processes and effects. But these resources have their limitations in the same individual at a given time, and in different individuals at different times, and become progressively weaker after the limit has been reached and passed. The inadequacy, in some cases, of the natural resources to successfully combat disease conditions is well known, but it is particularly obvious in certain infectious diseases (*e. g.* diphtheria, small pox, tetanus, septicemia, etc.), where the bacteria causing the disease multiply with almost unthinkable rapidity, and the decomposition products (toxins) are so large in quantity and so virulent in character that they tax the system to its utmost to eliminate them, or this failing, they cause death.

Within the last five years, however, there have been placed upon the market medicinal products which, injected into a body infected with certain diseases, have the property of strengthening the natural resources to combat conditions arising from the disease. These products are called "Antitoxins" or "Serums," and their use the "Serum Treatment."

In their preparation, the natural processes that take place *inside* of the human body in its fight to overcome infection and its effects, are duplicated *outside* of the human body, that is, in the serum of animals. An "antitoxin," therefore, is a modified serum (properly purified) which has the property of combatting infectious diseases and their effects in the same manner as that possessed by the human body itself.

In the preparation of small pox vaccine, the micro-organism of small pox is developed in calves, and is then transferred to the patient who elaborates in his own body, from the organism, the antitoxin necessary to confer immunity. Diphtheria antitoxin acts in the human body probably by chemically destroying the poisonous products of the bacteria causing the infection. It exhibits, also, a physiological action, supplying to the body the same elements that the body develops to protect itself against the poisonous bacterial invasion.

The true nature of the active principle of diphtheria antitoxin is an unsolved problem. It may be an organic substance, an organized product, or an enzyme or soluble ferment (which are proteid or nucleo-proteid in chemical character). The small dose of antitoxin, its rapidity of action, and its profound influence upon the human system, would suggest that it might be enzymic in character, although there is no positive evidence to sustain this theory. The power of some enzymes for work is almost unlimited. A sample of invertase which had inverted 100,000 times its own weight of cane sugar was found by O'Sullivan and Tompson to be still

active. ("Soluble Ferments and Fermentations," p. 120, J. Reynolds Green.)

The preparation of antitoxins is of interest. That of diphtheria antitoxin is typical of the others, and is as follows: A culture of diphtheria bacilli is grown upon Loeffler's solidified blood serum, and the colonies grown are transplanted into faintly alkaline bouillon (in flasks) and kept at a uniform temperature of 37° C. The bacilli rapidly multiply and produce large quantities of a highly poisonous product or toxin (diphtheria toxin), after which the bacilli are destroyed by the addition of 1 per cent. trikresol, and their dead bodies are removed by filtration.

The toxicity of the toxin, or rather its antagonism to antitoxin, is found by injecting it into guinea pigs, the standard of strength being such that 0.01 to 0.1 Cc. should kill the control animal in from 24 to 36 hours. The antitoxin is then prepared by injecting the toxin into horses, which are used because they are most easily handled, and because they yield large quantities of a serum that is less irritating in its effects upon the human system than that of other animals. Further, horses are naturally immune to diphtheria, and this immunity is greatly strengthened by the toxin treatment. Disease-free animals only are employed, the mallein test being used to detect glanders, and the tuberculin test for tuberculosis.

The first injection of the toxin is about 1 Cc., and it is repeated every 5 to 8 days in gradually increasing amounts. The limit of toleration is generally reached in from 9 to 12 weeks, when as much as 300 Cc. may be borne. As soon as the injection of large amounts of toxin into the horse causes but a slight rise of temperature, trial bleedings are made, and the product is tested. If the test proves satisfactory the horse is bled quite freely, the blood being collected in sterile bottles and cooled for about a day. The serum is removed from the coagulum with a pipette, and preserved by the addition of 0.4 per cent. of trikresol. The serum is then standardized. The standardization is expressed in immunizing units. An immunizing unit is ten times the quantity of serum that is necessary to save from death a 300-gram guinea pig that has received ten times its minimum fatal dose (determined by a series of experiments upon average animals per gram of body weight).

This test is very accurate. Where, for example, 9 units of antitoxin have failed to save the life of a certain guinea pig, 10 units of the same antitoxin have saved the life of an animal of the same family, weight, etc.

This finished antitoxin is placed in glass tubes, which should contain a fixed number of units to each Cc., ranging from 250 to 500 units. The most useful strength is 500 units to each Cc. The immunizing dose is from 300 to 500 units, the curative dose from 2,000 to 10,000 units. The glass tubes are hermetically sealed. The antitoxin retains its strength for six months or longer. The trikresol present makes the serum slightly fluorescent, but does not precipitate any active principle. So long as there

has been no septic change in the preparation, (and this can only be absolutely prevented with trikresol) there need be no fear of overdosing.

In fact, wonderful as has been the reduction of the mortality of diphtheria with the antitoxin treatment, it would have been still more pronounced had the fact been earlier recognized that the *time* to give diphtheria antitoxin is as early as possible in the infection, before large quantities of the toxins have been formed, and that the *dose* should be as large as the exigencies of each particular case will permit. It is better by far to give a larger dose than is apparently necessary than to err in the direction of a too small dose. When ferric hydrate is given as an antidote in arsenical poisoning, no one would think of giving just enough of it to neutralize the amount of arsenic actually taken; an excess is always employed to make the assurance of antidoting doubly sure. Similarly, when it is wished to arrest the effects of rapidly multiplying bacteria, an excess of antitoxin should always be used, and, if necessary, repeated in from six to eight hours.

A word now with reference to the preservation of diphtheria antitoxin. It should not be kept upon the upper shelves of the store, where there may be excessive heat or gaseous fumes. In the Philadelphia Hospital, the writer used for the purpose of storage, a dust-proof drawer in a part of the drug store remote from direct heat, and about equi-distant between floor and ceiling. The results were entirely satisfactory.

Jacobi has said: "The principal question to be raised in reference to any modifications in cases of serious disease, is its life-saving power." Measured by this standard there is, now, absolutely no doubt as to the life-saving power of diphtheria antitoxin, and great as has been the reduction in mortality by its use (from about 40 per cent. to 18 per cent., and this with about only 60 per cent. of the diphtheria cases being treated with antitoxin) the reduction can be made still greater in the future, when its use becomes more general and the importance of early treatment becomes more generally recognized.

The manufacturers of the country have now a standard "unit of strength" which they have agreed to follow, and tests for identity and purity can be readily framed. The question arises at this point as to whether or not the time has come when official recognition should be accorded diphtheria antitoxin. Here is a remedy that has saved thousands of lives, and if safeguarded by appropriate tests in the Pharmacopœia—tests which should fix a proper standard for identity, purity and strength—may save many more lives, relatively. As the case now stands, while manufacturers recognize a "standard unit of strength," there is no general agreement as to the number of immunizing units that each Cc. shall contain, nor is there any guarantee that manufacturers hereafter engaging in the making of antitoxin will accept the standard of the present manufacturers, and follow it.

A large number of States have food and drug laws, and these latter, as

a rule, recognize the U. S. Pharmacopœia as the official standard in the matter of medicinal products. If antitoxin were officially recognized, its standard of strength could be controlled in these States surely, and in the others, most probably. The criticism may be made that antitoxin cannot be officially recognized with tests for identity, purity and strength, because the Pharmacopœial Convention held in Washington last week, directed in its general instructions to the Committee on Revision, that:

"The Committee is instructed to append assay processes to as many of the potent drugs and preparations made therefrom as may be found possible, provided that the processes of assay are reasonably simple (both as to methods and apparatus required) and lead to fairly uniform results in different hands. As regards the products of such assays, tests of identity and purity should be added wherever feasible. Physiological strength should not be introduced by the committee."

A casual reading of this declaration would imply that diphtheria antitoxin is not admissible into the Pharmacopœia, because an official recognition would be valueless unless supplemented by tests for determining strength; and with antitoxin these are made physiologically. But a more careful reading of the paragraph would seem to indicate that the requirement that no physiological test for determining strength should be introduced, was intended to apply only to vegetable drugs and preparations made therefrom, and that the matter of antitoxin (which has no preparations made therefrom) was not thought of. As the force of a law rests in its intent, the Committee on Revision can, the writer believes, decide that "Antitoxin" is not included in the scope of the resolutions above, and that it could be officially recognized and have tests prescribed for it.

The preparation of serum products in this country has developed into a most important industry. Not only are the domestic needs supplied, but the domestic products are shipped to all parts of the world, which indicates that they are surely winning their way in popular favor against the older French and German makes. This has been brought about by the higher concentration of the American antitoxin and the improved methods used in its preparation.

Should not the American antitoxin be now recognized by the American or United States Pharmacopœia, and become the standard for the world to follow?

MR. SAYRE: I hope the discussion upon this paper will have a certain direction. I think it a very important one, indeed, and the paper does not appear to be intended to influence the Revision Committee direct, but designed to influence this Association, to bring the influence of the Association to bear on the Committee of Revision. I believe that in accepting this paper we should do it in a cordial manner, and in order to make this proposition effective, I move that a committee be appointed to confer with the manufacturers and bacteriologists and therapeutists, with the view of ascertaining the feasibility of introducing antitoxin serum into the United States Pharmacopœia. I also move that the paper be received and take the usual course.

The motion of Mr. Sayre provoked considerable discussion, participated in by Messrs. Oldberg, Mayo, Hallberg, Eccles, Sayre and Beal, and having been seconded by Mr. Prescott, with the proviso that the committee to be appointed shall report next year, it was put to a vote and carried.

MR. OLDBERG: I move that the committee be appointed at a later time. I think specialists should be appointed on that committee.

The motion prevailed.

THE CHAIRMAN: This brings to a conclusion the papers in hand by the Chairman of the Section, and if there is no other business to be brought before us the installation of officers is in order.

MR. LYONS: There is one item of business to come before the Section, that in regard to the Research Committee for the coming year. I think two members drop out each year. I believe Mr. Dohme and Mr. Lloyd are the members whose terms expire. The committee would be in favor of permanency in the constitution of the membership as far as possible.

THE CHAIRMAN: The two members of the Research Committee whose terms expire are, as I understand, J. U. Lloyd and A. R. L. Dohme. It has been suggested by the Chairman of the Committee that it would be desirable that the Committee be a permanent one as far as possible, and we infer that he would like the same members re-elected.

MR. PRESCOTT: The time is for two years, I am quite sure.

MR. OLDBERG: I was especially requested by Mr. Lloyd to say that he is now so loaded with work that he cannot add anything more, or take any further responsibility on himself, and he desires to be excused from further service.

MR. LYONS: It is not for Mr. Lloyd's individual work that we want him particularly, but more that our Association may have the benefit of the Lloyd Library of pharmacy literature that he is maintaining. I infer that he is entirely willing to do whatever he can in that line.

MR. OLDBERG: There is no question at all that the Lloyd Library will always be open to the Association and the members of this committee.

The name of Mr. J. O. Schlotterbeck was proposed for membership on the committee.

Mr. Prescott also nominated A. R. L. Dohme to succeed himself on the committee.

On motion of Mr. Hallberg, the nominations were declared closed.

Mr. Hallberg then moved that the Secretary cast the affirmative ballot of the Section for Messrs. Schlotterbeck and Dohme, electing them as the new members of the Research Committee, and the motion was seconded and carried.

The Secretary stated that he had performed the duty assigned him.

THE CHAIRMAN: The next business in order is the installation of officers, and I

would ask Mr. Beal and Mr. Holmes to conduct the newly-elected Chairman to the chair.

When Mr. Oldberg came forward the Chairman said:

It is with very great pleasure, indeed, that the retiring Chairman introduces to the Section on Scientific Papers a gentleman well known to you all. You know his work in the past, and I am sure that the reputation of the American Pharmaceutical Association in its Scientific Section will be upheld.

MR. OLDBERG: I shall not attempt to inflict any speech on the Section. I simply wish to say that I shall endeavor to do my duty during the coming year, and hope to succeed nearly as well as my predecessors.

The committee conducted Mr. Kebler, the newly-elected Secretary, to the chair, and Mr. Kebler said:

Gentlemen, I highly appreciate the honor which has been conferred upon me, and it will be a stimulus for good work for the Section, which I hope to do. I shall try to keep in mind the high class of work done in the past, and will do all in my power to make mine equal to it.

MR. OLDBERG: Mr. Kebler and I have consulted together about our associate for the coming year, and we have agreed on Mr. W. A. Puckner, of Chicago, to fill that position.

THE CHAIRMAN: The retiring Chairman wishes to express his appreciation to the Section for its kindness, and his very great indebtedness to the members who have aided him so much in carrying out the programme of the Section. It was the desire of the Chairman to carry on the reading of papers as promptly as possible, and he trusts that no discussion has been shut off unduly, or any papers improperly contracted.

I think the further business of the session had best be conducted by the new Chairman.

Mr. Oldberg took the chair.

Mr. Stevens moved that the reading of the minutes of the previous session be dispensed with. Carried.

THE CHAIRMAN: Are there any further reports of committees?

MR. HALLBERG: I move that the thanks of the Section be tendered the retiring officers for their faithful services during the past year.

MR. PRESCOTT: I take pleasure in seconding that motion. I believe the Section is very greatly indebted to the retiring officers for the very excellent meeting of the Section we have had.

The motion was carried unanimously by a standing vote.

THE CHAIRMAN: Is there any new business to come before the Section? If not, a motion to adjourn is now in order.

Upon motion of Mr. Stedem, the Section then adjourned.

MINUTES

OF THE

SECTION ON EDUCATION AND LEGISLATION.

FIRST SESSION—FRIDAY AFTERNOON, MAY 11, 1900.

The first meeting of the Section on Education and Legislation was called to order at 2 : 15 p. m., by Chairman Lowe.

The Chair announced that the first order of business, under the By laws, was the reading of the Chairman's Address, and Mr. Stewart was asked to take the chair while that was being done.

Mr. Lowe then read his address as follows :

Gentlemen : Your chairman would call your attention to the following matters relating to this Section. We are delighted with this opportunity of meeting with our Virginia members, but regret the necessity of being compelled to anticipate by four months our usual time of meeting; especially as it is in the comparative leisure of these four months that most of the work of this Section is done. We, therefore, fear that the number of papers coming before us will be greatly limited; but while this is regretable from one view point, it will give us the time to devote to the draft of the "Model Pharmacy Law," that will be reported by Mr. Beal, and to the report on "Preliminary Education for Students of Colleges of Pharmacy," to be submitted by Mr. Alpers.

In connection with the first of these subjects, viz., "The Model Pharmacy Law," I would call your attention to the following matters : although it is quite probable that most of them will also be reported upon, yet their importance is sufficient to warrant me in thus presenting and reiterating them.

In the first place, as pharmacy laws are enacted for the benefit of the citizens of the several states (and only incidentally for that of pharmacists), it is entirely reasonable and just that all expenses of administering such laws should be met by direct appropriation from the state treasuries, as is the case with the administration of other state laws, or state departments, and not by the fines or fees collected by the Pharmacy Boards. When the expenses of administering a pharmacy law are paid out of the accruing fines and fees, it lays the Board open to the criticism of rejecting applicants for registration so that they can get another fee from them, or of being unduly harsh in the administration of the law so that the accruing fines may swell their receipts. It also seems to me that it should be the duty of the prosecuting or district attorneys to prosecute all violators of the pharmacy law, as they do the violators of other laws of the state. In this connection I might say, that the evidence which is required in some states to convict a non-registered pharmacist

of the violation of the law by the compounding of prescriptions, viz., that such compounding was done in the presence of the witness, defeats justice, as in all such cases the compounding is done in privacy, special care being taken to exclude witnesses. It should be evidence enough that the written prescription was received over the counter and the compounded prescription handed back. It would seem to me that the time is near at hand when the expression of opinion, which was unanimously agreed to at the last meeting of this Section, viz., "that none but recognized graduates should be received by Boards of Pharmacy for examination," should be crystallized into action. Some twelve years ago, in a conversation with Prof. Maisch, he stated "that if he did not hold a professorship in a College of Pharmacy he should strongly urge this matter." At that time perhaps few held such an opinion; at the present time probably the majority do. An incident bearing upon this will probably be of interest. Recently in conversation with a college student, who had been rejected in three branches in the final examination, I endeavored to console him by telling him that it would not have been of any advantage to him to have passed, for he would have been rejected by the Pharmacy Board also. He politely informed me that he had already passed. I think it might give an impetus to the matter if the Secretary of this Section should communicate with the different Pharmacy Boards, acquainting them of our action, and urging them, where they have the power, to carry this action into effect, and to announce the time at which examination will be confined to graduated pharmacists only. A few years ago we heard much about the injustice done to pharmacy graduates in not allowing them to register upon their diplomas, but in recent years but little has been heard, as many clearly see that this would be the means of creating numerous Colleges of Pharmacy solely for the purpose of granting degrees; even as it is, so numerous have Colleges of Pharmacy become, that a number of the Pharmacy Boards which formerly granted this right have withdrawn it. The North Carolina Board said last year, "We have decided to no longer recognize diplomas, on account of the large number of new colleges springing up all over the country, thereby avoiding offense to any."

I should also like to see incorporated into each pharmacy law, "That the conviction of any pharmacist in a court of justice for violating the liquor or license law of his State shall forfeit his certificate of registration." This would be a much more effectual way of killing off the "saloon druggist" than by simply fining him.

The former Chairman of this Section suggested a new method of appointing members of State Pharmacy Boards. He suggested that they should be appointed jointly by the American Pharmaceutical Association and the American Medical Association from the members resident in such States. The committee to whom the matter was referred concluded that while such a method was excellent in theory, it was not practical. In thinking the matter over carefully I can not see any great advantage of this method over that in practice already in certain States, notably New Jersey. In the latter State, the State Association is required annually to present to the Governor five names from which the Governor is required to choose one to fill the vacancy annually occurring in the Board. This method of appointment takes the matter entirely out of politics, and should insure the appointment of the most competent pharmacists in the State. It might be said that in some States the membership of the American Pharmaceutical Association is not sufficient to constitute a Pharmacy Board.

The question is repeatedly asked, who is responsible for the large growth in the use by physicians of proprietary articles, and how can this tendency be best controlled? We think the responsibility rests in the first place upon the manufacturer of these preparations. They flood the physicians with circulars, and send out their detail men who are mostly free of samples and glib of tongue, who manage to convince the physician that their preparations are far superior to anything the retail pharmacist can possibly make, in fact they are the *sine qua non* of pharmacy. The physician, while well versed in histology,

pathology, bacteriology, gynecology, etc., etc., knows but little pharmacy, and thus falls an easy prey to these pharmaceutical missionaries.

Owing to the limited pharmaceutical instruction which is given even in the best medical schools in our country, and it is not to the credit of the medical students when I say that many of them get more than they want (in fact the time devoted to it was shortened at the protest of the students of one of our most prominent medical colleges a year ago), many physicians are not competent to dispense their own medicines, and welcome anything that will make the work easier.

A most potent reason is the lack of practice by young physicians in prescription writing. It is so much easier to write for somebody's glycerin tonic, than to formulate their own prescription, forgetting the fact that they are not exercising their therapeutical ability in thus doing, but are rather hiding their talent in a napkin.

The course inaugurated at one of our prominent medical colleges last year called "clinical conferences" will be of great value. Each student is required to go to the black-board and write out a suitable prescription for the disease as diagnosed. It would be excellent practice for each medical student of the fourth year class to be compelled to write out a prescription for each case he sees in hospital or clinic, such prescriptions to be criticised and marked by competent authority. A drill of this kind carried through a whole year's work would be of inestimable value, and would probably bring greater returns than much of their surgical knowledge.

I think the pharmacists are not altogether blameless in this matter, for many have sat supinely by seeing this part of their business slip out of their hands. Each pharmacist should make an effort to furnish the physicians of his locality with preparations equally efficient and elegant.

I would call the attention of manufacturers of fluid extracts to the importance of having the directions on their labels for making tinctures correct. While not friendly to the making of tinctures from fluid extracts, occasionally the practice must be resorted to. Recently when making small quantities of some tinctures I found the directions incorrect, the menstrua differing from that of the U. S. P. and precipitates resulting. I would also call attention to the want of uniformity in labeling fluid extracts. A very prominent firm uses both Latin and English names, as for instance Fluid Extract of Poke Berries, Fld. Ext. Rhus Glabra, Fld. Ext. Glycyrrhiza, Fld. Ext. Wild Cherry. Another firm uses mostly English names, or their synonyms, the latter to my mind not always being the most prominent ones, for instance Fld. Ext. Cimicifuga being labeled Fld. Ext. Black Cohosh.

As physicians generally use Latin names in their prescriptions, it would be preferable to use Latin names in labeling fluid extracts, at least it would lead to uniformity and would also have some educational advantages. The synonyms of course should have a prominent place on the label.

I think it would be wise if some simple price mark, as the Roman numerals, or the "tit-tat-to" cost mark could be adopted generally by pharmacists for pricing copies of prescriptions. This would insure a uniform price and would prevent the last dispenser from being considered extortionate from overcharging, or incompetent from undercharging. I know it may be charged against such a practice that it would simply give one away to his rivals, but I think the reverse is the case; where the price is unknown the tendency is to make it as cheap as possible.

According to the estimate furnished by the Secretary of the Treasury to Congress, there will be an estimated surplus for the fiscal year ending June 30, 1900, of $70,000,000. Would it not then be most eminently proper for us to urge, both collectively and individually, the repeal of the stamp tax, which bears so harshly upon the pharmaceutical profession.

During this last winter the question of Sunday selling has received much attention in

the City of Brotherly Love, through the efforts of the Philadelphia Sabbath Association, and many of the pharmacists belonging to the Philadelphia Retail Druggists' Association have pledged themselves to a reasonable observance of the day. Would not all the pharmacists of the country gain both mentally, morally and physically from a better observance of the day? If one day's rest out of seven seems to be absolutely necessary for the welfare of the animal creation, is it not still more necessary for man, the highest of creation? If the question of profit did not enter in, as is the case with one of our members of Lebanon, Pa., who gives all the profits on Sunday sales to charity, I think the question would speedily settle itself.

I am sorry that the good work done by many of the Pharmaceutical Colleges of our land is not more generally recognized by the public at large. Why is it that our rich men (even druggists themselves) leave their money to universities, hospitals, medical and technical schools, but seldom remember our own institutions? Is it because we have been so modest about their worth (pharmacists are generally most modest men) that the public does not recognize their value? If it were wise to let the public know how completely their fate is often in the hands of the pharmacist, the work of the colleges in turning out educated pharmacists would be better appreciated.

In conclusion I have pleasure in calling your attention to what seems to me is an era of good feeling among the pharmacists of our country. This is not the result of legislation, because our legal status is the same as a few years ago; but I think results from the organizations which have recently sprung into existence, bringing the pharmacists into closer touch with each other, thus enabling them to see much that is good in their brother man which was unknown before. I hope that the efforts which are being made to improve our financial condition will be made with sound judgment and along the lines of conciliation and compromise, that we will not allow ourselves to be forced into extensive and bitter quarrels, and above all things let us not forget that it will not do to leave the public out of our calculations, but we must so act as to deserve and win their good-will and support.

THE CHAIR; Gentlemen, you have heard the very interesting and able address of our Chairman. What is your pleasure?

Mr. Hallberg, seconded by Mr. Mayo, moved to refer to a committee of three for consideration and report. Carried.

Mr. Lowe resumed the chair.

THE CHAIRMAN: The next thing will be the report of the Secretary of the Section.

Mr. Koch then read his report as follows:

SECRETARY'S REPORT.

To the Section on Education and Legislation of the American Pharmaceutical Association:

Gentlemen: Your Secretary would report as follows:

With one exception, notwithstanding the numerous attempts, very little of importance has been accomplished in pharmaceutical legislation during the past winter. The following is a summary of such legislation as far as attainable:

California. A bill introduced by the Board of Pharmacy allowing druggists who had been in business six years before the passage of the Pharmacy Act in 1891, and those who were registered as assistants at that time, on proof of their being managers, to be registered as practicing pharmacists, was passed by both Houses, but failed to receive fhe Governor's signature.

Georgia. The law requiring pharmacists to pay a professional tax of $10.00 was repealed, as it conferred no benefits.

Louisiana. The Supreme Court decided against the State Pharmaceutical Association, who claimed that the Governor's veto of the law passed at the last session of the Legislature came too late to be effective.

Maryland. An attempt was made to pass a law covering the entire State, but, owing to delay in Committee, the bill failed to have its final reading before the Senate.

Massachusetts. Law was amended, prohibiting the re-examination of candidates until after the expiration of three months, thus enforcing longer intervals between examinations and insuring better preparation.

New Jersey. Two bills presented, but failed to pass.

New York. Probably the most important legislation during the past winter was the enactment of an entirely new law in this State, covering the entire State. It provides for the division of the State into three sections, each of which shall have a "District Board of five members, the fifteen members of the District Boards to constitute the State Board of Pharmacy." Any licensed pharmacist is eligible to membership. Two kinds of certificates are issued, viz., "licensed pharmacists" and "licensed druggists," the latter not being permitted to act as proprietors or managers in cities of more than 500 inhabitants, and having no rights in cities of 1,000,000 or more. The registration of apprentices is also provided for. A radical departure, the first legislation of its kind, is the requirement for the annual registration of every pharmacy, store, dispensary, or place in which there are compounded, dispensed, or sold drugs, medicines or poisons, and to require as a prerequisite for such registration the furnishing of evidence, satisfactory to the Board, that the same is conducted in full compliance with the law. Pharmacists are required to register but once. It provides that in cities of 1,000,000 or more inhabitants the number of working hours which shall constitute a day's work in a drug store or pharmacy shall be regulated by the Board, and shall not exceed 136 hours in each two consecutive weeks; regulates the sale of poisons; gives the Board power to summon witnesses to appear before it, and makes the United States Pharmacopœia the standard for the purity and strength of drugs and preparations sold. A bill elevating the standing of the pharmacist in the National Guard of New York, by which the pharmacist receives the rank and emoluments of first lieutenant, has also been passed.

Ohio. A bill enlarging the list of articles which unregistered persons may sell by adding quinine, Epsom salt, Rochelle salt, alum, oil of lemon and oil of cinnamon, also legalizing sale of Paris green by unregistered persons, was passed and is now a part of the Ohio law.

Virginia. Eight bills requiring the Board of Pharmacy to register individuals were passed.

STATISTICS OF THE PHARMACISTS OF THE UNITED STATES.

STATE.	Total on rolls.		Registered last year. By exam.		Registered without examination.				Ph. G.'s or P. D.'s on Rolls.	Women on Rolls.
	Registered Pharmacists.	Assistant Pharmacists.	Registered Pharmacists.	Assistant Pharmacists.	Ph. G.'s	M. D.'s	Other causes.	A. P.'s		
Alabama	879	....	20	....	3	8	2			
Arkansas	992	....	25	....	16	....	....	....	....	3
California	4977	947	97	36	94	....	7	3	1467	12
Colorado	625	33	72	18	....	....	....	....	130	6
Connecticut	500	300	40	....	21	....	40	....	....	7
Delaware	190	37	8	6	5	3	....	....	60	3
District of Columbia	799	....	13	....	14	....	....	....	.. .	3
Florida										
Georgia	1385	....	66	....	....	18	3	....	....	2
Illinois	4579	1245	122	171	....	....	53	20	....	111
Indiana	3846	378	19	6						
Iowa	3240	....	287	....	149	....	....	....	1000	80
Kansas	1419	67	49	8	33	....	2	2	201	22
Kentucky	1850	....	125	....	....	....	....	....	....	15
Louisiana	1052	272	33	9	....	....	5	....	....	12
Maine	829	36	34	6	....	....	....	....	....	9
Maryland	308	....	32	....	4	....	....	....	275	
Massachusetts	3916	....	51	...	....	....	....	....	....	61
Michigan	3099	324	59	118	....	....	1	....	....	76
Minnesota	1279	237	48	73	4	3	9	....	....	27
Mississippi	976	....	33	....	....	....	....	....	21	5
Missouri	3500	....	130	....	....	....	....	....	900	10
Montana	262	10	26	2	....	....	....	....	....	1
Nebraska	1455	....	41	....	....	....	....	....	....	13
New Hampshire	638	78	17	4	....	....	....	....	....	1
New Jersey	1475	39	53	14	....	....	36	....	....	4
New Mexico	88	13	6	5	12	....	6	....	23	2
New York State	5719	269	96	10	....	....	108			
New York City	5013	....	344	....	787	316	....	....	2118	58
New York—Erie Co. (Est.)	258	61	13	3						
North Carolina (Est.)	289	212	7	....	....	....	....	....	....	3
North Dakota	267	65	16	....	....	6	....	20	....	1
Ohio	3297	747	156	136						
Oklahoma	203	4	29	4	3	....	1	....	....	4
Oregon (Est.)	541	50	12	7	....	....	....	....	....	12
Pennsylvania	4280	1115	203	206	....	....	....	....	2500	55
Rhode Island	247	170	3	21	....	....	31	6	....	3
South Carolina (Est.)	270	....	20	....	14					
South Dakota	472	18	17	7	....	....	1	....	34	7
Tennessee	1243	122	17	10	....	....	118	11	....	5
Texas (Est)	1500	40	....	....	....	....	....	....	....	30
Utah (Est.)	263	40	14	....	20	....	....	8		
Vermont	350	2	23	2	....	....	....	....	....	5
Virginia	801	49	44	24	....	....	8	....	....	3
Washington	495	43	37	11	18	30	27	6	....	9
West Virginia	1179	....	59	....	5	....	....	64	47	5
Wisconsin	1485	443	57	63	....	....	7	....	....	35
Wyoming										

NUMBER OF REGISTERED PHARMACISTS IN THE UNITED STATES.

From Board reports	72,330
Estimated additional (Idaho, Wyoming and Florida)	1,017
Total	73,347
An increase over last year of	5,116

NUMBER OF REGISTERED ASSISTANT PHARMACISTS IN THE UNITED STATES.

From Board reports	7,466
Estimated additional	375
Total	7,841
An increase over number reported last year of	713

NUMBER OF PHARMACISTS REGISTERED LAST YEAR IN THE UNITED STATES.

From Board reports	4,828
Estimated additional	250
Total	5,078
A decrease from number registered last year of	7,141

NUMBER OF ASSISTANT PHARMACISTS REGISTERED LAST YEAR IN THE UNITED STATES.

From Board reports	1,110

Commenting on these statistics we find that the large increase in the number of registered pharmacists may presumably be accounted for by the registration in certain states, notably California, of many pharmacists in business at the time of the passage of the acts now in force.

Owing to the short time since the last meeting, during which time the fiscal year of many boards has not closed, it was difficult to obtain statistics. As far as possible deficiencies were estimated from the reports of registrations published in the pharmaceutical journals.

To the officers of the boards furnishing the requested statistics your Secretary desires to return thanks.

Respectfully submitted, J. A. KOCH, *Secretary.*

May, 1900.

THE CHAIRMAN: You can hardly conceive of how much labor it takes to gather these statistics. Letter after letter to the same party is often necessary. It takes a great deal of work, I can assure you.

MR. BARTLEY: By a resolution passed last year, it was ordered that the statistics gathered by the Secretary of this Section regarding the pharmacists of the United States should be sent to the various State Pharmacy Boards. I would like to know if that was done.

THE SECRETARY: About 500 reprints were received from the General Secretary and sent out to all the secretaries of the boards, and sometimes to the presidents. If the secretary did not answer, I would write to the president; and if he did not answer, I would write to somebody else.

MR. BARTLEY: Would the Secretary advise the continuance of the practice of asking the State Boards for these statistics?

THE SECRETARY: I think it would be advisable. And I want to make a suggestion to my successor in office, and that is that, in making requests for these statistics, he request

that they be brought up to the close of the last fiscal year of the board. As it is at present, many of these reports that we get are very much complicated, because sometimes they cover a longer and sometimes a shorter period of time. I also think it would be well again to send out a copy of this report, so as to keep the work of this Section before the various Boards.

MR. BARTLEY: I make a motion that we continue that practice.

THE CHAIRMAN: You have heard the motion of Dr. Bartley.

Mr. Whelpley seconded the motion and it prevailed.

MR. WHELPLEY: I desire to move that this Section extend its sincere thanks to the officers and members of the Boards of Pharmacy who have so kindly furnished us this information. I do this so that this action on our part may accompany the reprints of the statistics that are to go to them.

The motion was seconded and carried.

THE CHAIRMAN: The next business in order is the report of the Special Committee of last year to draft a model pharmacy law. As the report of the special committee has precedence of all standing committees, I will now call for the reading of this law. I would suggest that any amendments to the proposed law, to be read by sections, should be in writing and go over to another session. It is very important to have the language exactly correct, so that it will stand the test of the courts. Our ideas may be all right, but our language may be wrong, and we should be very careful in their expression.

MR. BEAL: I have written out a motion covering very nearly the same ground:

Resolved, That all amendments to the draft of a pharmacy law be submitted in writing.

That after debate, if adopted, they shall be referred to a committee of three, appointed by the Chair, for incorporation into the draft, and that the law as amended shall be reported for approval by the Section on Education and Legislation at its next session.

The reason for offering this has been explained in part by the Chair. Law begins with definition and ends with definition.

Mr. Eccles seconded the resolution and it carried.

Mr. Beal then read the preliminary remarks he had prepared in connection with his draft of a model pharmacy law, and also a summary of the model by sections, as follows:

THE OLD MODEL.

At the annual meeting of the American Pharmaceutical Association in 1869 a committee consisting of Messrs. Wright, Milhau, Moore, Stearns and Maisch, presented a draft of a general form of pharmacy law which, after extended discussion, was accorded a place in the Proceedings of the Association as representing the general principles which it was hoped would be followed in case the several States should attempt legislation regulating the practice of pharmacy.

Prior to the appearance of the 1869 model, only two pharmacy statutes were in existence in the United States, both of which were very imperfect and of limited application. Since then nearly every political division of the United States has provided itself with a pharmacy law, the general

plan of all being, in the main, similar to that of the model above referred to, though the different conditions existing in the various States have served to produce a very great variety in detail. Many new features not present in the old model have been developed, some have been greatly modified by the different hands through which they have passed, while others of the ideas originally advanced have proved to be impracticable, and have been abandoned.

This multiplicity of details in the several States and the unsatisfactory character of many of the statutes early produced a desire for a general revision, and, if possible, the creation of a substantial uniformity among the several enactments. Naturally the most convenient arena for the exploitation of this idea has been the annual meetings of the society which produced the original model, and for a decade past the subject has received especial attention at the hands of nearly every president of the Association, by the various chairmen of the Section on Education and Legislation, in many papers presented by many members of this Association, and by practically all of the pharmaceutical journals.

At the Montreal meeting of this Association in August, 1896, the writer presented a comparative exhibit of the pharmacy laws then in force in the United States, and offered a resolution providing for the appointment of a special committee which should enter into communication with the colleges and Boards of Pharmacy and Pharmaceutical Associations of the United States and Canada, and from the materials thus collected construct a model form of law to be submitted for the approval of the Association at its next annual meeting. The resolution failed of adoption in its original form, but was referred to the officers of the Section on Education and Legislation with power to act. Since then no further official action has been taken by the Association until the meeting at Put-in-Bay, Ohio, in 1899, when the present writer, much against his inclination, was appointed to prepare such a draft of a general form of law, which is hereby submitted.

THE MEANING OF THE TITLE "MODEL LAW."

At the outset, the writer frankly admits that his idea of what the model should be differs widely from that of some of the foremost writers upon the subject, and he, therefore, feels called upon to set forth, briefly, his reasons for the draft which is herewith presented.

In the first place, the writer is not in accord with some as to the construction to be placed upon the title "Model Law." Many have understood from this title that the proposal is for a form of law which shall be *ideally perfect*, both from a public and from a professional standpoint. From this interpretation the writer is compelled, by what he believes to be the necessities of the case, to dissent. An ideal law would be possible of enactment only in an ideal community, and if communities were ideally perfect, such a form of law would be useless. What was meant by the

resolution offered at Montreal was not a form of law which should be without fault, and, therefore, incapable of further improvement, but a *workable* draft, adapted to enactment in the various states where any form of law revolutionary in character would not receive serious consideration. While this may be a disappointment to some who have expected that the model would present some new and startling innovations, the author is of the opinion that a draft based upon a conservative plan will be of far greater helpfulness in promoting progress in pharmaceutical legislation than one based upon purely theoretical considerations could possibly be.

GENERAL PLAN OF THE MODEL LAW.

In accordance with the view above expressed, it has been attempted to frame the model in accordance with the following principles:

First: The model should be constructed as nearly as possible, wholly of tried and tested material, selected from statutes already in force, and should consist of provisions which have withstood the test of experience, and have been found to work well in practice. Experiments should be tabooed, and new provisions not found in existing statutes should be admitted only upon the clearest evidence of their usefulness and practicability.

Second: The machinery required for the enforcement of the law should be simple and inexpensive, as every complication increases the liability to break-downs, and the difficulty of enforcing the law.

Third: The form of statement adopted for the various provisions should be as clear and simple as is consistent with the technicalities of legal phraseology indispensable to accuracy and certainty.

Fourth: The provisions of the statute should be confined to the creation, support and direction of the board of pharmacy, the requirements for examination and registration, the regulation of the sale of poisons, and the definition and punishment of offenses against the law. Provisions regulative of adulterations, and other collateral matters should be left to the general statutes.

Fifth: Since experience has shown that nearly all State Boards are hampered by lack of necessary funds for the enforcement of the law, the draft should provide ample revenue for the use of the Board, and should allow its members such compensation as will justify them in devoting sufficient attention to the law to make it efficient.

SUMMARY OF THE MODEL BY SECTIONS.

Section *One* is unavoidably long. Its object is to forbid any one but licensed pharmacists from controlling or managing stores, and to prohibit unlicensed persons from selling drugs in any place or capacity. As criminal statutes must be construed with the greatest strictness, it is absolutely essential that the section which defines the crime should be worded with the greatest exactness and detail.

This section has been prepared after a careful study of all the State laws, and while the author does not flatter himself that it will be found invulnerable, he still ventures to hope that it may prove an improvement over many existing statutes, some of which are so loosely drawn that it is practically impossible to obtain convictions under them.

In order to make this section constitutional it is necessary that it shall not be a bar to the pursuit of any legitimate business or occupation, and for this reason several clauses of exceptions have been added. The first of these excludes from the operation of the section the right of a physician to furnish his own patients with such medicine as he may deem proper. This exception is not only in accord with public opinion, but is, we believe, essentially just and right, even if it does operate to reduce the number of prescriptions dispensed by the pharmacist. The right to furnish medicines to his patients is inherent in the physician, and it is not probable that the Legislature would attempt to deprive him of it, or that the courts would sustain any such attempt if made.

The next exception is that of non-poisonous domestic remedies and of patent and proprietary remedies which do not contain poisonous ingredients. While it is the opinion of the writer that the business of dealing in all such substances should be confined to the druggist, he is nevertheless convinced that the restriction herein contained is as much as can be expected in the present state of public education upon the subject.

The insertion of the exception regarding insecticides is based upon the same reasons.

The provision permitting legally licensed assistant pharmacists to manage drug stores in small villages, and dealers in general merchandise to sell certain drugs in country places, it is believed will do much to disarm the opposition of legislators from rural districts, and will at the same time permit the interests of the rural population to be sufficiently safeguarded.

Section *Two* provides that all persons registered or licensed at the time of enactment of the proposed law may continue to act under their license without re-examination. In States where renewal is not provided for, it would be necessary to modify this part slightly in order to make a portion of Section *Six* effective. The section also prescribes the nature of the application which must be filed by new candidates for registration.

Section *Three* prescribes the qualifications of pharmacists and assistants. The first must be 21 years of age, a graduate in pharmacy, have four years' experience in pharmacy, and must have been previously registered for two years as an assistant, and in addition must pass a satisfactory examination. Assistants must be 18 years of age, have two years' experience and sustain an examination, but are not required to be graduates.

The requirement of graduation as a pre-requisite to registration is now so generally admitted to be necessary that it need not be discussed.

The requirement that applicants must have been licensed for two years

as assistants is new in the United States, though not in Canada, but its necessity is equally as urgent as that of graduation.

It is conceded by all thoughtful students of the subject that it is at present far too easy for applicants to qualify as managers of pharmacies. The present laws seem to have been composed with the idea that there is a dearth of pharmacists, and that the public interest would suffer if the gateway to registration were not as wide as possible. There may be an occasional scarcity of properly qualified assistants, but if there has ever been an insufficient supply of pharmacists to meet all public demands, we have not heard of it.

Another provision of this section permits a reduction of experience in the case of those who have attended schools of pharmacy, provided, however, that a pharmacist must have not less than two years' experience, no matter how long he may have attended college. This is only a reasonable concession in view of the absolute requirement that all candidates must graduate before receiving license as pharmacists.

Section *Four* provides that licenses shall be granted to successful candidates for two years. This is for the purpose of avoiding the contention that when candidates are registered once, they are registered for all time, and therefore cannot be compelled to renew their registration.

The latter part of this section provides that the Board may refuse license to persons unfitted by reason of drunkenness or addiction to drugs, and that they may revoke licenses for the same cause. In order to avoid the possible charge of arbitrary abuse of power, an appeal is permitted to the Governor and Attorney-General. It is possible that in some States an appeal might have to be taken to a different body.

Section *Five* authorizes the Board to grant licenses to licentiates of other Boards, but safeguards the practice in such a way as to avoid possible abuse of the power.

Section *Six* contains the usual requirement as to the exposure and renewal of certificates and permits, and prescribes the penalties for failing to renew the same. In this section an effort has been made to state the requirement with clearness and ample detail, so as to minimize as much as possible any occasion for misunderstanding.

Sections *Seven*, *Eight*, *Nine*, *Ten*, *Eleven* and *Twelve* provide for the appointment of the Board of Pharmacy and prescribe its powers and duties. The provisions, in the main, are along the usual line of existing laws. Care has been taken to secure definiteness of statement on all important parts. Several features, perhaps, deserve special mention. One of these provides that the record of the Board of Pharmacy or a properly certified transcript therefrom shall be accepted as competent evidence in all courts. Another is that no provision is made for a treasurer, but that the receipts of the Board shall be covered into the State Treasury as a special fund for the use of the Board.

Another important feature is the one allowing the Board to employ an attorney, since local attorneys are frequently loath to undertake prosecutions under the pharmacy law, and usually do so in only a half-hearted way.

Perhaps some objection may be found with the size of the fees required for license and renewals, but the writer is convinced that they are not too great for the expense of the Board in order to execute the law as it should be executed.

Section *Thirteen* provides for the labeling and recording the sale of poisons. In the author's opinion it is not within the wit of man to prepare a schedule of poisons which will not still leave something to be desired. Either it will be too broad or too narrow, or either too loose or too rigid. It is not likely that the present attempt has escaped any of these objections. The utmost that has been hoped for has been to prepare a section which shall be reasonably comprehensive without being oppressive, and which shall afford a reasonable protection to the public without too great an interference with trade rights.

Section *Fourteen* requires the preservation of the original of every prescription for a period of five years. The desirability of this provision is doubtless sufficiently obvious without extended explanation.

Section *Fifteen* imposes a license upon itinerant vendors of medicines. Doubtless it would be better if such might be suppressed altogether, but until public opinion is further advanced than at present, probably the most that can be done is the regulation of the business by the Board of Pharmacy in the manner indicated.

The purposes of Sections *Sixteen*, *Seventeen*, *Eighteen* and *Nineteen* are sufficiently obvious without comment.

Mr. Beal next proceeded to read the draft of the proposed law* by sections the reading of each section being followed by earnest discussion, showing that the members present not only took a deep interest in the subject, but were also anxious that the model law should be made acceptable to all persons and all sections of the country, as far as possible. Numerous amendments were offered, some of which were adopted and others rejected, the whole matter (twelve sections of the new law having been dtsposed of at the time of adjournment), being finally referred to the special committee to be appointed for the purpose of presenting at a later session a revised form of the law for adoption. Among those who participated in the discussion of the model law were Messrs. Alpers, Anderson, Bartley, Beal, Caspari, Eccles, Good, Hallberg, Hynson, Lyons, Mayo, Oldberg, Payne, Pettit, Sheppard, Sherrard, Stedem, Stevens and Whelpley.

The chair appointed as the committee to incorporate in the draft of the proposed model pharmacy law all the amendments adopted by the

* The complete draft of the model law, as amended and finally adopted, will be found on page 309. THE GENERAL SECRETARY.

Section, Mr. Beal, Mr. Oldberg, and Mr. Sheppard; the same committee to present a revised form of the law for adoption.

MR. BEAL: I think, perhaps, that committee had better be larger. I move that the number be changed to five, and I suggest the addition of Mr. Hallberg's name.

The motion was so put and carried.

The chair appointed Mr. Hallberg and Mr. England additional members of the committee.

At four o'clock, after the discussion of section 3 of the model law, the chair announced that the hour fixed by the Entertainment Committee for a trolley ride through the city had arrived.

Mr. Oldberg moved to request the Council to see to it in the future that the entertainment features of the meetings shall not interfere with the work of the Sections.

Mr. Bartley seconded the motion.

MR. CASPARI: I desire to say for the Local Secretary and for the Council that the programme suggesting this trolley-ride was adopted for the reason that there is present at every meeting a large number of ladies and gentlemen who desire these entertainments; but there is no occasion for adjourning the Section. Those who want to go trolley-riding can do so, and the rest can stay here in session. It is not obligatory at all on the Section to adjourn.

MR. MAYO: In the Council I voted against the adoption of the programme last year, which gave us an excursion one day in the week, but my protest was overruled, and, I think, it is well for us to express our sentiments on this subject. In a general way, we prefer the work of the Association to be fairly close together, though there might be half a day devoted to excursions, possibly. I know some gentlemen who have gone away and missed this particular session because of this matter.

MR. WHELPLEY: The motion, as I understand it, is to ask the Council to prevent a repetition of this condition. Being in sympathy with the present Local Secretary—and also with the Local Secretary elected for next year—I would like to have it distinctly understood that the Council fixes the programme, though the Local Secretary is accessory to the crime.

MR. ALPERS: The Local Secretary is a member of the Council?

MR. WHELPLEY: Yes, sir; and accessory to the crime. From fifteen or sixteen years' attendance at the meetings I can say that about the same dissatisfaction occurs annually, no matter what the programme is. I remember twelve years ago, when there was complaint because our entertainments were given at the end of the sessions. It was said that they should be mixed in with the sessions. On the strength of that, at the White Mountains, we started our meeting on Wednesday, so we could have a Sunday intervening, and that idea was carried out for a while. But it may be time now for the other side to have its inning, and the rest can wait.

Mr. Oldberg's motion was put to a vote and carried.

Mr. Stewart moved to adjourn, but the motion was voted down.

THE CHAIRMAN: The next order of business is the nomination of a Chairman and Secretary to serve the Section for the ensuing year. Nominations are in order.

MR. HALLBERG: I take pleasure in nominating as Chairman of the Section for the ensuing year, Mr. Koch, the present Secretary.

Mr. Beal seconded the nomination.

MR. GOOD: I take pleasure in putting in nomination our present Chairman.

Mr. Bartley seconded the nomination.

THE CHAIRMAN: Gentlemen, I am not at all desirous of serving again, though I thank you for the honor of mentioning me in that connection. Mr. Koch has made an excellent Secretary, and there is no doubt he would make an excellent Chairman,

MR. GOOD: My suggestion of the Chairman's name was not intended as a reflection on Mr. Koch in any way.

On motion of Mr. Stewart, the nominations for Chairman were closed.

Mr. Beal nominated Mr. Koch, the present incumbent, for Secretary, and Mr. Nattans seconded the nomination.

The Chairman stated that the names of the nominees would be posted, to be acted on at the final session, and then announced Messrs. Hallberg, Stewart and Stedem as the committee to consider and report upon the Chairman's address.

On motion of Mr. Good, an adjournment was had to 8:45 p. m.

SECOND SESSION—FRIDAY EVENING, MAY 11, 1900.

The session was called to order by Chairman Lowe at 9:20 p. m.

Upon motion of Mr. Whelpley, the reading of the minutes of the first session was dispensed with.

On motion of Mr. Stewart, debate on the remaining sections of the model pharmacy law, to be read by Mr. Beal, was limited to five minutes, no person to be allowed to speak twice on the same subject.

The Chair announced that the election of officers of the Section was the next order of business, and said that a ballot would be taken for Chairman, there being two nominees for that office.

Mr. Beal, of the committee appointed to take the ballot, announced that the result showed 29 ballots cast, and one blank; that Mr. Lowe had received 21 ballots and Mr. Koch 8.

CHAIRMAN LOWE: I thank you, gentlemen, for your vote.

On motion of Mr. Good, Mr. Beal was directed to cast the affirmative ballot of the Section electing Mr. Koch to the office of Secretary.

Mr. Beal announced that he had performed that duty, and the chair declared Mr. Koch elected accordingly.

THE CHAIRMAN: The order of business now is the further consideration of the draft of a model pharmacy law.

Mr. Beal read the remainder of his draft of the model law by sections,

and as at the previous session, considerable discussion ensued. Four of the sections, Nos. 16, 17, 18 and 19, were approved as read, while in the case of the remaining three sections some changes were suggested and adopted, chiefly of a minor character, relating to phraseology, etc.

In accordance with the resolution adopted at the first session, this part of the law, with amendments adopted, was also turned over to the special committee of five, to whom the first twelve sections had been referred, with a request to report the complete law in revised form at the next session.

Those who took part in the discussion of the last twelve sections of the pharmacy law were Messrs. Alpers, Bartley, Beal. Eccles, Good, Hallberg, Hynson, Kennedy, Mayo, Oldberg, Porter. Sheppard, Stedem, Stewart, Thompson and Whelpley.

The question of legal decisions of special interest to pharmacists having been raised, Mr. Beal stated that he had in preparation a book which will contain a majority of the decisions of all the courts of this country and Great Britain, bearing on pharmacy laws, collected by himself.

On motion of Mr. Stedem, the Section adjourned until to-morrow morning at 10 o'clock.

THIRD SESSION—SATURDAY MORNING, MAY 12, 1900.

The Section was called to order at 10 : 15 a. m., by Chairman Lowe.

On motion of Mr. Ryan, the reading of the minutes of the previous session was dispensed with.

At the request of the chair, Mr. Stewart read the report of the Committee on National Legislation as follows :

REPORT OF SPECIAL COMMITTEE ON NATIONAL LEGISLATION.

The question of National Legislation on the subject of patents and trade-marks is, as you are aware, officially in the hands of a commission appointed by President McKinley for investigation. So far as your committee was able to assist in the labors of said commission, by presenting to it the views of the Association, this has been done; and the subject of patents and trade-marks as affecting medicinal wares, has repeatedly been discussed by your committee with the commission.

Members of this committee appeared before the commission both at its meetings in Chicago, New York, and Washington, and also took part in the discussion of the same subject before the International Commercial Congress in Philadelphia. At those meeting of the commission we reaffirmed the position taken by the Association at the several annual meetings where the question was discussed and acted upon.

JNO. F. PATTON,
A. B. LYONS,
ALBERT E. EBERT,
HY. P. HYNSON,
F. E. STEWART.

SUMMARY.

1. The endeavor of the so-called "Proprietary Medicine" business to erect a secret patent system and establish it by law under the guise of trade-mark legislation has thus far proved abortive.

2. The names of secret medicines registered as trade-marks are either descriptive or deceptive. If these names be descriptive they are not trade-marks, for it is an axiom of law that a descriptive name cannot be a trade mark. If, on the contrary, they are deceptive, their alleged owners cannot come into court to defend them with clean hands, and only such as have clean hands can have any status in courts of equity.

3. The Supreme Court of the United States has decided that the name of a patented medicine, whether it be a coined name or not, passes over to the public domain when the patent for the article itself expires. Hear the decision of the court: "The result, then, of the American, the English, and the French doctrine universally upheld is this, that where, during the life of a monopoly created by a patent, a name, whether it be arbitrary or be that of the inventor, has become, by his consent, either express or tacit, the identifying and generic name of the thing patented, this name passes to the public with the cessation of the monopoly which the patent created. Where another avails himself of this public dedication to make the machine and use the generic designation, he can do so in all forms, with the fullest liberty, by affixing such name to the machine, by referring to it in advertisements and by other means, subject, however, to the condition, that the name must be so used as not to deprive others of their rights or to deceive the public, and therefore that the name must be accompanied with such indications that the thing manufactured is the work of the one making it, as will unmistakably inform the public of that fact."

4. There is only one patent system in the United States. Its object is to promote progress in science and useful arts, and thus advance civilization. The theory upon which the patent law rests is that it is to the interest of the community that persons should be induced to devote their time, energies and resources to original investigation for the furtherance of science, the arts, and manufactures. This was recognized from the earliest periods which can pretend to be described as civilized. It is to the advantage of the whole community that authors and inventors should be rewarded, and no measure of reward can be conceived more just or equitable, and bearing a closer relation to the benefit conferred by the particular individual, than to grant him the sole right to his writing or discovery for a limited period of time.

5. Under the patent law, the monopoly is limited to seventeen years; the monopoly is granted in exchange for the publication of the working formula; the formula must be published in such exact and explicit language as to permit any one skilled in the art to duplicate the product; the invention must be new and useful; the inventor must display greater skill than naturally to be expected from skilled physicians, pharmacists and chemists in the ordinary practice of their respective vocations; the Patent Office must furnish a description of the invention at a nominal cost to any one who may apply for the same; the patent is a *contract* between the inventor and the Government, representing the public at large; fraudulent claims made in applications for patents or in advertisements in their exploitation vitiate the contract and invalidate the patent.

6. The reasons why we object to the so-called proprietary system are these: It hinders progress in science by its secrecy; it injures scientific nomenclature by its system of fanciful names which are finally forced into the common language as generic or specific names; it permits non-inventors to obtain the rewards which should be granted to inventors only; it gives a higher degree of protection to non-inventors than the patent system gives inventors; it enables business men with no medical or pharmacal training to compete unfairly with physicians and pharmacists by appropriating physicians' prescriptions, giving them fanciful names, concealing their composition by secrecy as to formula or method of manufacture, and launching them on the public as specifics or cures when they are not; ignorance, incompetency and dishonesty receive by it protection, while honesty and endeavor to improve are discouraged; the name "proprietary" is a misnomer and deceptive, for no proprietaryship in formulas can be acquired by

trade-marks, and any pharmacist has a perfect right to make and sell the same thing under the same name when he knows how to do so, just so long as he does not injure other manufacturers or deceive the public by failing to so label his package as to show that the thing manufactured is the work of the one making it.

7. Finally, it is essential to the welfare of the community that the knowledge of preparing medicines, and applying them to the treatment of disease be conserved in scientific forms, and thus be protected from pretence, fraud, and error. This requirement demands that each medicinal drug and preparation be provided with a name compatible with the accepted principles of scientific nomenclature and intelligently expressible in all languages; that the origin, nature, composition, and method of preparing all remedial agents of a drug character be published and readily accessible; that the various methods of preparation be used in common by pharmacists and submitted to comparative tests by physicians, so that those which, under given conditions, produce the best results be adopted as official; that practicable standards be established for the identity, quality, and strength of medicinal wares, and that all manufacturers be required to conform strictly thereto; that the properties of drugs and chemicals be determined by pharmacodynamic tests; that their usefulness as therapeutic agents be ascertained by clinical application; that the relative merits of various remedies recommended for the same diseases be published for the guidance of physicians; that methods be established for the readiest possible detection of impurities and deteriorations; that colleges be created and maintained for teaching the knowledge thus evolved to students, who shall go out and put the same to practical application, and obtain a livelihood by its practice; and finally, that the professions of medicine and pharmacy co-operate in the publication of knowledge of medicinal drugs and chemicals, and that the same be diffused to the professions in common by means of text-books and periodical publications.

This ideal can never be accomplished under the proprietary system of secrecy and perpetual monopoly. To carry it into effect necessitates fraternity and co-operation. Pharmacy must become a fraternity. The members of that fraternity must adopt beneficent, altruistic and co-operative effort in place of selfishness. The endeavor must be to elevate the fraternity itself, and in so doing elevate the individuals who compose the fraternity. This can be accomplished only by devotion to science, to the profession, and to humanity. Every pharmacist must freely donate the knowledge of his discoveries to the common fund of knowledge and receive his reward in the reputation and professional position gained thereby. If the scientific system of the patent laws can be made to contribute toward that end it should be endorsed. Medical and pharmacal books are copyrighted and science is the gainer by it. In similar manner science may gain by patents. And it is a question well worth considering whether it might not be advisable to grant copyrights for limited times on the names of medicines in exchange for the publication of working formulas. But secrecy and selfishness must be discouraged as inimical to professional and public welfare.

Mr. Stedem moved that the report, with accompanying comments, be referred to the Committee on Publication. Carried.

THE CHAIRMAN: The next thing in order is the report of the Delegation to the Pure Food and Drug Congress, held March 7–9, 1900.

MR. STEWART: I indicate the presence of a committee of the Chamber of Commerce of Richmond, and I move that the privileges of the floor be extended to these gentlemen, and that they be invited to join in the debate on this report.

It was so ordered.

THE CHAIRMAN: Is there any member of this committee present to read the report? If not, it will be read by the Secretary.

The Secretary of the Section then read the report as follows:

REPORT OF DELEGATES TO THE NATIONAL PURE FOOD AND DRUG CONGRESS, WASHINGTON, D. C., MARCH 7–9, 1900.

Pursuant to call, the National Pure Food and Drug Congress convened at Washington, D. C., on March 7, 1900.

Great interest had been aroused throughout the country by the Senate Food Investigating Committee and the "embalmed beef" agitation, so that much was to be expected from the transactions of this particular congress, especially as the deliberations of previous congresses had been embodied in the form of the Brosius House of Representatives Bill No. 6246, introduced in the 56th Congress.

The object of the National Pure Food and Drug Congress is "to secure suitable legislation of a national character to prevent the adulteration of food, drinks and drugs, and to secure the enforcement of such laws; to secure and promote uniformity in State legislation, and in the rulings of the State departments.

"To create and maintain a high public sentiment upon these important subjects, and to uphold and sustain all public officers charged with the enforcement of such regulations.

"To promote a more general intelligence concerning the injury to health and to the business interests of honest producers, manufacturers, dealers and exporters, resulting from food adulteration, and concerning the importance of proper food, properly prepared, to the health of the people."

In order that the congress might fairly represent the various boards of health, the medical, pharmaceutical, chemical, commercial and manufacturing interests as well as the State and governmental interests, the executive committee had arranged for the following appointment of delegates:

The Governors of each State and Territory are requested to appoint ten delegates, distributed as follows: agriculturists, four; pharmacists, two; wholesale grocers, one; retail grocers, one; food manufacturers, one; proprietary manufacturers, one.

Agricultural Department.—The Secretary of Agriculture and five delegates to be appointed by him.

The Internal Revenue Department.—The Commissioner and five delegates to be appointed by him.

Surgeon-General of the Army and five delegates to be appointed by him.

Surgeon General of the Navy and five delegates to be appointed by him.

The Surgeon-General of the Marine Hospital Service and five delegates to be appointed by him.

The Fish Commissioner and five delegates to be appointed by him.

Boards of Health.—State Boards of Health, three; Boards of Health of cities of from 20,000 to 100,000 population, one; cities of from 100,000 to 500,000 population, two; cities of 500,000 population and upwards, three.

Boards of Trade and Chambers of Commerce.—Cities of from 20,000 to 100,000 population, one; cities of from 200,000 to 500,000 population, two; cities of 500,000 population and upwards, three.

Agricultural Associations.—National Grange, P. of H., five; each State Grange, two; National Farmers' Alliance, five; each State Alliance, two; National Farmers' Congress, five; National Horticultural Society, three; State Horticultural Societies, one; National

Dairy Association, five; State Dairy Associations, one; National Bee-keepers' Association, three; State Bee-keepers' Associations, one.

Official Organizations, etc.—Each State Agricultural Department, two; each State Food and Dairy Commission, two; each Experiment Station, two; each Official Agricultural Chemist, one; each Agricultural College, one; National Pure Food Association, five; each Pure Food Association, two; each State Board of Pharmacy, one; State Board of Agriculture, one.

Scientific and Medical Societies.—American Chemical Society, five; State Chemical Societies, two; local Medical Societies in cities of from 10,000 to 100,000 population, one; cities of 100,000 to 500,000 population, two; cities of 500,000 population and upward, three; American Pharmaceutical Association, five; State Pharmaceutical Associations, two; separate organizations in cities, one.

Trade Organizations.—Bakers' National Association, three; Bakers' State Associations, one; Bee-keepers' Union, three; Cider and Vinegar National Association, three; Cider and Vinegar State Associations, one; National Confectioners' Association, nine; State Confectioners' Associations, one; Dairy Union National Association, five; Dairy Union State Associations, one; Druggists' Wholesale National Association, five; Druggists' Wholesale State Association, one; Grocers' National Wholesale Association, five; Grocers' Wholesale State Associations, one; National Cheese Manufacturers' Association, three; State Cheese Manufacturers' Associations, one; National Retail Grocers' Association, five; State Retail Grocers' Association, three; fishing interests, five; National Preservers' Association, five.

Trade Organizations (liquor trade).—United States Brewers' Association, five; State Brewers' Association, one; National Liquor Association, three; State Liquor Associations, one; National Vintners' Association, three; State Vintners' Associations, one; National Millers' Association, five; State Millers' Associations, one; National Proprietary Association, five; National Women's Christian Temperance Union, five; State Women's Christian Temperance Unions, two.

From the American Pharmaceutical Association there had been appointed; M. N. Kline, J. N. Hurty, J. H. Manning, F. W. R. Perry, and J. F. Geisler, Chairman. Of these, Messrs. Geisler, Kline and Hurty were in attendance, and Messrs. Corning and Hynson, of Baltimore, who acted as substitutes for some of the absent members.

The first meeting of the National Pure Food and Drug Congress was called to order in the Harper Building at noon on Wednesday, March 7th, by the president, Hon. J. E. Blackburn, Food and Dairy Commissioner of Ohio. An unusually large delegation was in attendance. The report of the committee on credentials showed that delegates had been appointed from 46 States, Territories, the District of Columbia and the island of Puerto Rico, and from seventeen national organizations, besides those from local organizations. There were in actual attendance 258 delegates from thirty-one States, Territories and the District of Columbia, representing 13 National and 95 State and local organizations.

A hearty address of welcome was given the delegates by Commissioner John B. Wright, of the District of Columbia. This was followed by addresses by Mr. Matthew Trimble, the Hon. James Wilson, Secretary of Agriculture, Col. J. H. Brigham, the Hon. Marriott Brosius, and others, after which the meeting adjourned to Wednesday evening, to give the various committees an opportunity to organize and agree upon amendments, etc., in the interim.

A special meeting of the delegates representing the drug and pharmaceutical interests was held in the National Hotel on Wednesday afternoon. Mr. Geo. A. Kelly acted as chairman, and Mr. W. L. Cliffe, as secretary. The difference between the various bills under consideration was explained to the delegates by Dr. Frear. Of the Mason, Brosius and Babcock bills, the latter did not find favor among the delegates, as it did not

mention drug interests, but confined itself to food only. The discussions at the special meeting, therefore, resolved themselves into minor amendments of the Brosius H. R. bill No. 6246, after which, upon motion of Mr. M. N. Kline, the following resolution was adopted:

"*Resolved*, That the Brosius bill (H. R. No. 6246), as thus *amended* represents the views of the drug delegates, and practically was the result of the past work of the different congresses, and that it be adopted as a whole."

The amendments, with one or two exceptions, were subsequently accepted and embodied as amendments at a regular meeting of the National Food and Drug Congress.

On Wednesday evening the congress reconvened at the Harper Building. At this meeting Dr. William C. Frear, of Pennsylvania, Chairman of the Executive Committee, made a formal report on the various changes made in the Brosius bill since the (1899) session of the National Food and Drug Congress, and also explained the objectionable features of some of the other bills then before the 56th Congress.

Of these the Mason (Senate Bill No. 2426) and Brosius bills were similar in administrative features. The Brosius bill was drafted principally by Chief Chemist H. W. Wiley of the U. S. Department of Agriculture. The Babcock bill was drawn by Food and Dairy Commissioner H. C. Adams, of Wisconsin, at the request of Mr. Babcock. In short, it may be explained that, as the discussions at the congress hinged principally on the Brosius and Babcock bills, the Babcock bill ignored the matter of drugs, and also differed from the Brosius bill in its administrative feature. Section 1 of the Babcock bill provided for the establishment in the U. S. Department of Agriculture of a Food Bureau, the head of which shall be a Presidential appointee. The Commissioner to receive a fixed salary and to hold office for four years.

The discussions resulting necessitated referring the question of the various bills to a Committee on Resolutions. The committee, formed of one representative from each State, by a vote of 24 to 1 favored the Brosius bill with the minor amendments indicated later on.

The minority report, as represented and ably defended by Mr. H. C. Adams, favored the Babcock bill, or at least the substitution of section 1 of the same for section 1 of the Brosius bill. A very prolonged and heated discussion followed in the regular meeting on Thursday, when the motion was made to make the substitution. On vote the Babcock feature was lost by a vote of 74 to 47. As this seemed the pivotal point of the discussions, the other amendments, as noted below, were adopted without much opposition.

The one of importance to "drug" interests is in the amendment dropping the National Formulary and leaving the United States Pharmacopœia the recognized standard for "drugs" as defined in the act.

As the features of the Brosius H. R. bill 6246 have been before the public for some time, particular attention is called to the changes or amendments made at this National Pure Food and Drug Congress and enumerated below.

In the full bill (Senate Bill 3618, introduced by Mr. Proctor, March 15, 1900) the particular parts of sections containing the amendments adopted are printed in heavier type.

CHANGES MADE OR MATTER DROPPED FROM THE BROSIUS H. R. BILL NO. 6246.

In the Brosius bill Sec. 5 the term "drug" included "all medicines recognized in the United States Pharmacopœia and National Formulary for internal or external use, and cosmetics."

From this the "National Formulary" and "and cosmetics" were dropped, and the words "and preparations" inserted after "medicines."

Article 2, Section 6, Brosius Bill, in the case of drugs. "If when sold under or by a

name not recognized in the United States Pharmacopœia, but which is found in the National Formulary, it differs from the standard of strength, quality or purity, as determined by the tests laid down in said work." Dropped.

Lines 21 to 23, Section 6, p. 4 of the Brosius Bill were transposed under a new heading and embodied in lines 29 to 32, p. 3 of bill No. 3618.

Line 13, p. 4, Brosius Bill "or a drug," after the word food, was dropped.

Line 36, p. 4, Brosius Bill, read "signed by the wholesaler, jobber, manufacturer or other party from whom, etc." amended to "signed by the manufacturer or the party or parties from whom, etc."

Line 42, p. 4, Brosius Bill, the word "retailer" changed to "dealer."

Section 7, Brosius Bill, "That the Secretary of Agriculture is hereby authorized to cause all compound, mixed or blended food or drug products to be properly branded, and prescribe how this shall be done." The section was dropped, being covered by the provisions of Section 6.

Lines 5 to 8, p. 5, Brosius Bill after the word "select" in and such physicians, not less than five, as the President of the United States shall select from the Medical Department of the Army, the Navy and the United States Marine Hospital—the words "three of whom shall be" were inserted. Also, after Hospital, the word "Service," and line 8, p. 5, Brosius Bill, by "reason of the attainments in physiological chemistry and hygiene" was changed to by "reason of their attainments in physiological chemistry, hygiene, commerce and manufacture."

Line 15, p. 5, Brosius Bill, between the words "all" and "courts" the words "United States" were inserted.

Lines 5 and 6, p. 6, Brosius Bill, the words "at the expense of the said manufacturer or dealer" were dropped.

Line 15, p. 6, Brosius Bill, shall be "fined not exceeding one hundred nor less than ten dollars, or imprisonment not exceeding one hundred nor less than thirty days, or both" was amended to read "fined not exceeding one hundred dollars or imprisonment not exceeding one hundred days, or both."

Line 27, p. 6, Brosius Bill, after the word adulterated the words "or misbranded" were inserted.

Line 38, p. 6, Brosius Bill. After the words United States, the following clause was inserted "but such goods shall not be sold in any state contrary to the laws of that state."

Sec. 13, p. 6, Brosius Bill. "That for the purpose of enabling the Secretary of Agriculture to carry out the provisions of this act, and for the compensation and expenses of experts, and for the compensation of such chemists, inspectors and clerks as may be necessary, and for an additional compensation of two thousand dollars for the Chief Chemist, as Director of the Bureau of Chemistry, and for necessary traveling and miscellaneous expenses, the sum of one hundred thousand dollars, or so much thereof as may be necessary, is hereby appropriated from any funds in the treasury not otherwise appropriated." This entire section was expunged.

With the above changes and amendments the "Brosius" Bill was finally passed by a unanimous vote, and represents the deliberations of this congress.

In its amended form it was introduced in the United States Senate, 56th Congress, First Session, on March 15th, 1900, by Mr. Proctor, as bill No. 3,618, and after its second reading referred to the Committee on Agriculture and Forestry.

The amended bill was also introduced in the House of Representatives on March 16, 1900, by Mr. Brosius, as bill 9,677, and referred to the Committee on Interstate and Foreign Commerce.

The above bill is really the culmination of over twenty years of effort so commendably inaugurated by the agitation of the question of food adulteration in the *Sanitary En-*

ginecr (Edit. Henry Meyer), and brought to a focus by the $1,000 prize offered by Mr. F. B. Thurber through the National Board of Trade at its annual meeting in 1879, when the following resolutions were adopted:

WHEREAS, The public mind has of late been considerably agitated by the alleged general adulteration of food; and

Whereas, The question of pure and wholesome food and drink is one of great importance to the people of the United States; and

Whereas, Local attempts to regulate the sale of food have on account of limited jurisdiction or other causes, generally proved inadequate for the purposes for which they were designed, and it is, therefore, important that wise laws (if possible national in character) should be enacted which will afford adequate protection both to consumers and honest manufacturers; and

Whereas, A member of this Board offers to place $1,000 at the disposal of the Executive Council of this Board for a prize or prizes to be given for the best act or acts, accompanied by an essay designed to prevent injurious adulteration, and regulate the sale of food without imposing unnecessary burdens upon commerce; therefore be it

Resolved, That the President of the National Board of Trade be authorized to appoint a committee of experts, to be composed of five members, one of whom shall be a member of the medical profession, one a chemist, one a member of the legal profession, and one a merchant; said committee to examine and pass upon the merits of any acts or essays which may be submitted to them, and to award prizes therefor. The committee as soon as possible after their appointment, to make public the necessary conditions, and when their labors are completed, to place in the hands of the President of the Board an act designed to accomplish the purpose above described.

The committee of award consisting of John S. Billings, Surgeon U. S. Army, Vice-President National Board of Health, Washington, D. C.; Prof. Chas. F. Chandler, President Board of Health, New York; Ex-Chancellor B. Williamson, Elizabeth, N. J.; A. H. Hardy, Esq., of Boston; John A. Gano, Esq., of Cincinnati, from the numerous replies received, awarded the

1st prize to G. W. Wigner, F. C. S., London,

2d prize to Vernon M. Davis, College of City of New York,

3d prize to William H. Newell, M. D., Jersey City Heights, New Jersey,

and recommended the printing of the essay by O. W. Wright, and the remarks of Prof. A. B. Prescott, Ann Arbor, Mich.

The remarks and recommendations of the above award committee submitted at the time are so pertinent and applicable to present day food and drug legislation in general, that they are, at least in part, worthy of reproduction.

"The question of the adulteration of food, with perhaps the exception of milk, should be considered not so much from a sanitary standpoint as from that of commercial interests; as being of the nature of a fraud, in aiding the sale of articles which are not what they are represented to be. The main object of legislation upon this subject should be to prevent deception, to furnish to the public authoritative information, and to nullify the operations of ignorant and sensational alarmists, who damage the business interests of the country quite as much as do the evils of which they complain.

"We are of the opinion that there is much more danger to health and life in this country from adulterated drugs than there is from adulterated food, and that any legislation which is to deal with the one should also deal with the other.

"To indicate the legislation upon the adulteration of food and drugs which will protect health and prevent fraud, and at the same time not impose unnecessary burdens upon trade, is a matter of great difficulty, as the result of this competition clearly shows, for we do not consider any of the acts proposed to be satisfactory. In this matter it is much better at first to do too little than too much, and the first steps in such legislation should be tentative and educational in character.

"While it is highly desirable that the general principles of legislation on this subject should be the same in all States, we do not think it possible to secure by State laws absolute uniformity in the details in all parts of this country, and it would therefore be unwise to make the attempt.

"We do not think that any law upon the adulteration of food and drugs can be made efficient without a properly constituted health authority to supervise its execution. The questions involved are in a high degree technical, and require special training in those charged with administering the law. At the same time we think that the existence of such health authorities should be taken for granted in the acts, and that these should not attempt to create them. We believe that every State should have a board of health, but that such boards should be created by independent legislation.

"We think it unadvisable that the law should attempt to define in detail as to what an adulteration is. A very considerable amount of discretion should be left to the Board of Health in this respect, limiting it only in the direction of possible over-rigidity. Many well recognized articles of commerce, although harmless and even useful, may be said to be adulterated, and it should be left to the discretion of the Board to exempt any article from the penalties imposed in the act.

"Care should be taken not to make the penalties excessive. It should be remembered that mere exposure of fraudulent practices, if effectually and persistently made, is in itself a penalty, and as a rule public opinion may be trusted to make such practices unprofitable if measures be taken to make this opinion a correct one, which we think should be the great object of the law proposed. Under no circumstances should fees or moieties to informers be allowed.

"We think that both State and national laws upon this subject are desirable. The State law should deal with the subject in the individual State. The national law should deal with adulterated articles coming from foreign countries, or passing from one State to another, and also with adulterations in the Territories, the District of Columbia and all places under the jurisdiction of the United States. It is, of course, in the highest degree desirable that the State and United States legislation on this subject should not be discordant. The educational features should be even more prominent in the National than in the State law, while the punitive feature should, if anything, be less severe. As the State laws will vary somewhat in this last respect, it follows that the penalties in the United States law should be at a minimum."

Further, the sections of the bill then drafted by the Committee and approved by the National Board of Trade and introduced in Congress at the time have been the backbone upon which the food and drug laws since that period have been drafted.

The sections of that bill which may be of particular interest are the following:

Sec. 9. That an article shall be deemed to be adulterated within the meaning of this Act—

(*a*) In the case of drugs:

1. If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality, or purity laid down therein.

2. If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other Pharmacopœia or standard work on Materia Medica, it differs materially from the standard of strength, quality or purity laid down in such work.

3. If its strength or purity fall below the professed standard under which it is sold.

(*b*) In the case of food or drink:

1. If any substance or substances has or have been mixed with it so as to reduce or lower or injuriously affect its quality or strength.

2. If any inferior or cheaper substance or substances has or have been substituted wholly or in part for the article.

3. If any valuable constituent of the article has been wholly or in part abstracted.

4. If it be an imitation of or be sold under the name of another article.

5. If it consists wholly or in part of a diseased or decomposed, or putrid or rotten animal or vegetable substance, whether manufactured or not, or, in the case of milk, if it is the product of a diseased animal.

6. If it be colored or coated, or polished or powdered, whereby damage is concealed or it is made to appear better or of greater value than it really is.

7. If it contains any added poisonous ingredient, or any ingredient which may render such article injurious to the health of a person consuming it; provided that the National Bureau of Adulterations may, with the approval of the Secretary of the Department of from time to time declare certain articles or preparations to be exempt from the provisions of this Act; and provided further, that the pro-

visions of this Act shall not apply to mixtures or compounds recognized as ordinary articles of food, provided that the same are not injurious to health, and that the articles are distinctly labeled as mixtures, stating the components of the mixture.

Sec. 10. That it shall be the duty of the National Bureau of Adulterations to prepare and publish from time to time lists of the articles, mixtures or compounds declared to be exempt from the provisions of this Act in accordance with the preceding section. The National Bureau of Adulterations shall also from time to time fix the limits of variability permissible in any article or compound.

Sec. 11. The term "food" as used in this Act shall include every article used for food or drink by man. The term "drug," as used in this Act, shall include all medicines for internal or external use.

Sec. 12. All the regulations and declarations of the National Bureau of Adulterations made under this Act from time to time and promulgated shall be printed in the statutes at large.

Sec. 13. This Act shall take effect ninety days after it shall become a law.

In submitting this report, it may be added that Senate Bill No. 3618 (and the new Brosius Bill, H. R., No. 9677) at least embodies as a unit the consensus of opinions of a representative assemblage of the public. As such it will receive due consideration before the Fifty-sixth Congress, provided interest is not allowed to lag. In its course through Congress it is subject to the dangers of amendments and the opposition of interested trade interests. It is not a stringent bill when compared with that above quoted.

In view of the fact that the public is warmed up to the desirability of a National Food and Drug Law, and believing that with the proper effort this is a particularly opportune time to accomplish the enactment of a National Food and Drug Law, it is the sense of this committee that some definite action should be taken on the drafted bill by the American Pharmaceutical Association, and if a suitable majority favor it, that a strong resolution be drawn and passed urging upon Congress the necessity for passing the bill without delay. Imperfect organization and lack of funds embarrass the efforts of the sessions of the National Food and Drug Congresses.

The annual efforts will be recurrent and passing shadows unless some more persistent effort is made to induce Congress to act upon the recommendations. To enable a more vigorous prosecution of the work, a special finance committee was appointed and authorized to receive and collect contributions.

The committee consists of F. E. Dawley, Chairman, Fayetteville, N. Y.; Gallus Thoman, New York.; A. J. Parlin, Cincinnati, O.; W. S. McMechlin, Wheeling, W. Va.; A. J. Walter, St. Louis, Mo.; Antonio Sbaboro, San Francisco, Cal.; A. L. Martin, Harrisburg, Pa.

Some united and well-directed effort on the part of the Association may bring into realization what past food and drug congresses have been unable to accomplish.

JOSEPH F. GEISLER, *Chairman.*

THE CHAIRMAN: The report of the delegates to the Pure Food and Drug Congress is now before you. I hope you will make your remarks as brief as possible and to the point, and let them not exceed five minutes for each one; I think it would be a good thing for no gentleman to speak more than once until all the rest have a hearing.

On motion of Mr. Stewart, seconded by Mr. Alpers, the report was ordered received, to take the usual course.

At the suggestion of President Prescott, and upon motion of Mr. Mayo, a recess of ten minutes was here taken to permit a short session of the general Association to be held.

Upon reassembling, the Chairman stated that the report of the Delegation to the Pure Food and Drug Congress was now before the meeting for discussion.

Mr. Stewart introduced Col. Purcell, of the Richmond Chamber of Commerce, who said:

Gentlemen, I desire to thank you on behalf of the Chamber of Commerce for your courtesy. We recognize the fact that this Association, with all others, is desirous of having such a law as will guarantee to the people of the country pure food, and especially pure drugs and medicines, and that we have laws to bring that about. But there is a section of this Brosius Bill to which your attention should be particularly directed. On behalf of the Richmond Chamber of Commerce, I desire to present Mr. John Stuart Bryan, of this city, who will direct your particular attention to that feature of the Brosius Bill.

Mr. Bryan then spoke as follows:

Gentlemen: It has been delegated to me on behalf of the Chamber of Commerce to come before this body and say why they object to certain features of this bill. The Chamber of Commerce is a body representing all the business interests of this city and its moral and sanitary welfare. It appreciates the necessity of good food and good medicine, and rejoices in anything that looks to that end. But there are all sorts of ways of reaching the end in view. It is evolution or revolution. Do you wish to reach the end by sure progress and by building up a healthy public sentiment, or do you wish by one blow of legislation to reach that end, and then perhaps have to recede from it, and forfeit the result desired?

Section 7 of the Brosius Bill says, in part:

That it shall be the duty of the Secretary of Agriculture *to fix standards of food products when advisable, and to determine the wholesomeness or unwholesomeness of preservatives and other substances* which are or may be added to foods, and to aid him in reaching just decisions in such matters, he is *authorized* to call upon the Director of the Bureau of Chemistry and the Chairman of the Committee on Food Standards of the Association of Official Agricultural Chemists and such physicians, *not less than five, as the President of the United States shall select, three of whom shall be from the Medical Departments of the Army, the Navy, and the Marine Hospital Service, and not less than five experts, to be selected by the Secretary of Agriculture by reason of their attainments in physiological chemistry, hygiene, commerce, and manufacture,* to consider jointly the standards of all food products within the meaning of this Act, and to study the effect of preservatives and other substances added to food products on the health of the consumer; and when so *determined* and *approved by the Secretary of Agriculture* such standards shall guide the chemists of the Department of Agriculture in the performance of the duties imposed upon them by this Act, and *shall remain the standards before all United States courts.*

You will observe that the effect of that would be to give you a careful and definite analysis by experts as to the ingredients of foods and drugs, but after that is determined by these experts on *ex parte* testimony this shall be a standard to go before the United States courts. Now, suppose a man was manufacturing something about which experts might differ, he would be thrown into court, and before he could be heard in his own behalf, he would be wholly undone and ruined. If a man was pushed into court on this *ex parte* testimony, and it was done without regard to his desires or his interest—as it would be—he would find himself confronted with the authority of the Government, and without any chance to do more than plead guilty, if this analysis showed the articles to be injurious in their composition. We want this body to use its influence for pure food, and to allow no guilty man to escape, but in pursuing the guilty and protecting the people who are to buy these foods and drugs, do not ruin a man by the mere lapse of time, which you here do if you allow this bill to go through. Suppose the Secretary of Agriculture of to-day is wrong in his ruling as to a product, and the next one in office decides that he was wrong, look at the injustice done the manufacturer. What we want you to do is this, to advocate an amendment of this character, that the Secretary of Agriculture shall have the right to determine the wholesomeness or unwholesomeness of any article of food or drug, and cause the article or drug so manufactured to be branded, and carry on the outside of the package what the ingredients are; and if injurious, the

press will soon tell the public. That will build up a healthy public sentiment, and will result in great good. Then if a man goes on and does business improperly in spite of this showing, the district attorney can bring him before the court, where he will have a chance to defend himself. We ask only a recognition of the genius of our people. We believe that no man should be deprived of his life, liberty or property without due process of law. We had an example last year of an *ex parte* testimony, taken in another great nation, where there was no jury, and the accused had no chance to defend himself before the bar. We have not so soon forgotten the travesty on justice presented by the Dreyfus case. And so here, the men who are engaged in the manufacture of these things may be ruined, without having an opportunity to be heard by a jury. There is no desire to give the manufacturer a chance to foist something unwholesome on the public, but simply that the citizen of this country may have the right to manufacture his goods until it appears that he is transgressing the law, and we ask that he be allowed to appear before the court and defend himself when that charge is made.

THE CHAIRMAN: Is not ample protection provided for under section 8? You will notice there a great deal of care is taken in the gathering of samples. Three samples must be taken under direction of the Department of Agriculture, one to be given to the person from whom procured and the others to be analyzed. It would seem that that was a sufficient safeguard, would it not?

MR. BRYAN: That section throws safeguards around the analysis, but section 7 says when the analysis is made and determined it shall be evidence in all United States courts, and that is what we object to. Here is the amendment on this point that we want —I shall not take up your time to read over now the whole of the amending section:

"Such standards and determinations when so fixed by the Secretary of Agriculture for the use of the chemists of the Department may be read in evidence in the United States court; but shall not be considered as determining the adulteration of any articles under section 6 of this act, until such standards and determinations are approved in the courts."

If you will examine section 8, you will see that it is simply a safeguard to protect the manufacturer from having any unfair sample of his goods taken. The Government takes one, the analyst takes one, and the manufacturer takes one himself. That is to protect him against the taking of an unfair sample of his goods by the official appointee, and to prevent such appointee from determining by his own *ipse dixit* whether the thing is wholesome or not, and making it a crime to deviate from the standard thus fixed. We take it for granted that the Secretary of Agriculture, no matter how good or perfect he may be, is only human; and there is no chance under this bill for the manufacturer, in case he believes he has been done an injustice, to bring witnesses and confront those of the Government and cross-examine them. You know the committee for the Mason bill reported adversely against alum as a baking-powder ingredient, and yet out in Missouri, when a case came to be argued before Judge Clark, he said that though he went into the case with preconceived notions against alum, he believed it was all right when the case was over. We say let a man appear in court and prove to a judge or jury what the ingredients of his goods are, and let him confront the Secretary of Agriculture with counsel and evidence on his own side. That is simply the object of this proposed amendment. He cannot do that as the bill now stands. When a man goes to court and finds the record made up against him, he has nothing to do but submit, though it may be that the finding is wrong.

THE CHAIRMAN: The Secretary of Agriculture is to be aided and assisted in reaching these decisions by five chemists, to be appointed from very different sources, and they are to study the effects of preservatives and all these other substances added to food products. I simply suggest this thought.

COL. PURCELL: The chemist is not a physiologist always, and chemical deduction may be very different from physiological experience; and in a case of this sort, however right he might be in his chemical analysis, or however right the standard shown may be, the citizen is nevertheless deprived of one of the elemental rights guaranteed by the Constitution, that a man's property shall not be taken from him without due process of law. By what authority does the National Government undertake to deny us that right? It is certainly not due process of law when to one man, or his appointee, is submitted the right to determine whether my property is contraband or not. The only tribunal that can decide that question is a jury of my peers, and to that jury we appeal, and ask that this Association shall not lend itself to a sacrifice of the rights of the citizen on a great question like this. This is but another step forward to that centralization of power which is the danger of the republic, and which is the danger of all republics, and I trust you will bear this well in mind.

MR. MAYO: I move that the Section on Education and Legislation recommend to the American Pharmaceutical Association the endorsement of the proposed amendment to the Brosius bill offered by the Chamber of Commerce of the City of Richmond. I am heartily in accord with what Col. Purcell has said with regard to the dangerous tendency to encroach on the liberties of the citizen. This is the age of centralization. The war has given the central government a great many additional powers, and we are in danger of developing into a bureaucracy instead of a democracy. I earnestly urge the passage of the amendment. I put it in the form of a recommendation to the general Association to endorse the proposed amendment giving the right to the citizen to be heard before a court, and I am confident no court of final appeal will ever deny that right to the citizen.

Mr. Stedem seconded the motion of Mr. Mayo.

MR. STEWART: I second the motion also. The Committee on National Legislation looked into this matter, and said it was no more than fair to recommend the amend ment as being an improvement on the original bill.

MR. PRESCOTT: I support the amendment, though I do so without confidence that I understand the situation fully. I am not a lawyer, or judge of law, but it seems to m that if the argument for this amendment is true, a similar amendment will be sure to be offered in Congress before the bill can go through. It would be impossible, it seems to me, for a bill to get through that would deny trial by due process of law. I know there were two bills before the Pure Food Congress, and the Brosius bill obtained a majority vote. The Babcock bill was supported by a minority. I think we can do no harm in adopting this amendment. I shall favor, however, that in presenting any memorial to Congress upon the subject, we accompany it by a copy of the report of the delegation to the Pure Food Congress, and, if possible, by a stenographic report of the substance of this plea from the Chamber of Commerce, which should certainly have a full hearing with the report of our delegation.

MR. STEWART: I would like to amend the motion by referring this matter to a committee before taking action.

MR. PRESCOTT: I hope that will be withdrawn; we will not have time for that.

COL. PURCELL: Would it be proper for us to offer a written report from the Chamber of Commerce?

MR. PRESCOTT: That would be perfectly agreeable to me.

Mr. Prescott's motion was put and carried.

Mr. Eccles, seconded by Mr. Stedem, moved to adopt the resolution of Mr. Mayo as thus amended, and the motion prevailed.

MR. HALLBERG: I want to enter a protest against the use of the word "drug" as found in this bill. A drug is a dried organic substance. It does not include chemicals and things of that kind. I do not suppose it can be changed now, however.

THE CHAIRMAN: The next thing in order will be the reception of the report of the committee to which were referred the amendments to the model pharmacy law.

MR. SHEPPARD: Before reporting in detail the work of the Committee, I would like Mr. Beal to say a word on the general subject of a pharmacy law.

MR. BEAL: I have only to say as to this law a word of caution regarding what we are to expect from it. I do not expect—and I hope no one in this Association expects—that any Legislature will feel obliged to take up this law and adopt it *verbatim*, or even a single section of it, though it may be done. Our object is to place before every Board of Pharmacy, and every Pharmaceutical Association, and every Committee on Legislation, our idea of what a proper, practical and fairly efficient and progressive form of law should be; and we expect them to select from this, and to adapt to their own particular circumstances and to the degree of advancement they may have in the particular State in pharmaceutical matters such parts as they may need, and make use of them. The reason I think it important to speak on this apparently trivial question is this: So many people have argued against such a form, saying that it cannot be used—that there is little or no hope of getting the Legislatures to adopt it. We do not anticipate this, though it would be desirable, but believe the substance of it may be adopted by some of them. I want to inculcate this idea, so that we may not be disappointed.

MR. SHEPPARD: Your Committee worked a good while, and very carefully over this law, so I hope there will not be any unnecessary time occupied on questions of detail. We took the whole discussion and all the proposed amendments and worked them in very carefully, and we made one or two radical changes which we propose to recommend.

The first important change is in Section 1, where we put in the word "own" in the second line—"It shall be unlawful for any person not licensed as a pharmacist within the meaning of this Act to *own*, conduct or manage any pharmacy," etc.—believing that to be the most effective way of bringing that important matter to a crisis, as it were, for the question can only be settled by testing the law in the courts.

THE CHAIRMAN: Is that change agreeable to the Section? If there is no dissent, I will take it that it is.

MR. SHEPPARD: In the 11th and 17th lines of section 1, we have struck out the word "immediate," so that it will read "except as an aid to or under the supervision of a person licensed as a pharmacist," etc., thus making the provision a little more elastic—not so iron-clad.

THE CHAIRMAN: Is that change acceptable to the Section? It seems to be, as there is no objection.

MR. SHEPPARD: In the last line of the first paragraph and also the last line in the second paragraph of section 3, the word "before" is stricken out and the words "by or under the direction of" inserted in place thereof, so that that part of the section reads, "and he shall also pass a satisfactory examination *by or under the direction of* the Board of Pharmacy."

THE CHAIRMAN: Is that change acceptable? There is no dissent, and it will be passed.

MR. SHEPPARD: In the 2d line of the 2d paragraph of section 3, after the words "18 years of age," the words "shall have had a sufficient preliminary general education," have been inserted. That is to keep ignorant boys out—those who have not a knowledge of reading, writing and arithmetic.

MR. ANDERSON: Under the provisions of section 3, is it possible for a man to be registered as a pharmacist who has not served a single day in a drug store? According to this section, time spent in a college or college education is taken as time spent in a store—that is the way I understand it. It would seem here that a man could attend college for four years, without ever serving a day in a store, and yet be licensed.

MR. SHEPPARD: The last lines of paragraphs 1 and 2 are very broad, and say "he shall pass a satisfactory examination by or under the direction of the Board of Pharmacy." It is not to be supposed that the Boards will not have sense enough to look after this matter. And then it says in the last paragraph, "but in no case shall less than two years' experience be required for registration as a licensed pharmacist."

MR. ANDERSON: Experience in a college of pharmacy?

MR. SHEPPARD: No, sir; practical experience in a pharmacy.

THE CHAIRMAN: The legitimate construction to be placed upon it is experience in a pharmacy, not in a college of pharmacy.

MR. ANDERSON: It is not so stated.

THE CHAIRMAN: There being no radical dissent, the section as amended is passed.

MR. SHEPPARD: In section 4, 3d paragraph, strike out the word "and" in the 3d line after the word "General," so it will read that an appeal "may be taken to the Governor and Attorney General, the decision of which officers," etc., instead of "*and* the decision," etc.

There was no dissent, and the section as amended was passed.

MR. SHEPPARD: In section 5, 5th line of the 1st paragraph, at the end of the line, strike out the words "the same," and in the next line strike out the words "as are" and insert "equal to those," so that it will read, "The Board of Pharmacy may issue licenses," etc., provided that the applicant for such license shall present satisfactory evidence of qualifications *equal to those* required from licentiates," etc.

There was no dissent, and the section as amended was adopted.

MR. SHEPPARD: In line 7 of the 2d paragraph of section 6, strike out the word "thereof" and insert the words "of license," so the sentence will read, "If the Board shall find that the applicant has been legally licensed in this State and is entitled to a renewal *of license*," etc.

No objection, and the section was passed.

MR. SHEPPARD: In the 6th line of the last paragraph of section 6, strike out the word "proceed" and insert the words "pay the same fee" in place thereof, so that it will read, "shall be required to *pay the same fee* as in the case of original registration." This sentence as it stood meant re-examination, but with this change it means that a

man may be reinstated by the payment of a small fine, as it were. We think that we did good work on that, and that this change gives a happy solution to this question.

THE CHAIRMAN: I think the committee acted wisely. If there is no dissent, the change will be adopted and the section passed.

MR. SHEPPARD: We have also made an addition at the end of the last paragraph of section 6, which is intended to apply to the question of drug departments in the large department stores, and possibly other cases. The new addition reads thus: "The name of the responsible manager of every pharmacy, drug store or apothecary shop shall be conspicuously displayed upon the outside of such place of business."

There was no dissent, and the amendment was adopted and the section passed.

MR. SHEPPARD: In the 2d line of the 1st paragraph of section 7, after the word "pharmacists," insert "and actively engaged in the practice of pharmacy," so it will read, "The Board of Pharmacy shall consist of five persons licensed as pharmacists *and actively engaged in the practice of pharmacy* within this State," etc.

There was no dissent, and the section was passed as amended.

MR. SHEPPARD: In section 8, 2d paragraph, 2d line, strike out "for" and inser "upon"—"The secretary shall give a bond in such sum as may be prescribed by the Board, conditioned *upon*," etc.

No dissent. Adopted.

MR. SHEPPARD: In section 9, 4th paragraph, 2d line, insert the word "all" after the word "in" and before the word "matters," so it will read, "The President and Secretary shall have the power to administer oaths in *all* matters pertaining," etc.

No dissent. Adopted.

MR. SHEPPARD: No change in section 10. In section 11, 1st line, strike out the word "the" and insert the word "receiving"—"Upon *receiving* information," etc.

No dissent. Adopted.

MR. SHEPPARD: In 3d line of the same paragraph, between the words "shall" and "file," insert "upon direction of the Board," so it will read, "shall, *upon direction of the Board*, file a complaint and prosecute the offender therefor."

No dissent. Adopted.

MR. SHEPPARD: In section 12—the question of renewal of license and re-registration—the Committee reduced the charge for renewal in the case of the license of a pharmacist from $2.00 to $1.00, and in the case of an assistant from $1.00 to 50 cents.

No dissent. Adopted.

MR. SHEPPARD: In section 13, 5th line of first paragraph, insert the word "barium" after "antimony."

No dissent. Adopted.

MR. SHEPPARD: Strike out the word "intended" in the 2d paragraph, 9th line, and insert the word "alleged" in place thereof, so as to read "the purpose for which it is *alleged* to be used," etc.

In the last line of the same paragraph strike out the word "the" before the word "inspection," and insert the word "by" in place of the word "of." Then it will read, "and shall at all times be open to inspection *by* the proper officers of the law."

In the 1st line of the next paragraph the word "provision" should be in the plural, "provisions."

No dissent. Adopted.

MR. SHEPPARD: In the 2d line of the last paragraph of section 13, change the word "or" after the word "upon" to "nor," so as to read, "And it is further provided that it shall not be necessary to place a poison label upon *nor* record the delivery," etc.

No dissent. Adopted.

MR. SHEPPARD: In the last line but one of the first paragraph of section 14 strike out the word "the" before "inspection" and the word "of" just after it, and insert the word "by" in place of the word "of," so as to read, "shall at all times be open to inspection *by* duly authorized officers of the law."

No objection. Adopted.

MR. SHEPPARD: In section 15 your committee made a most radical change, by striking out the whole of the latter part of the section, letting the section end with the word "deformity" in the 5th line. This does away entirely with the licensing of peddlers—or, rather, does away with the peddling business. The section now reads:

"It shall be unlawful for any person to sell or to offer for sale by peddling, or to offer for sale from house to house, or to offer for sale by public outcry or by vending in the streets, any drug, medicine, chemical, or any composition or combination thereof, or any implement or appliance or other agency for the treatment of disease, injury or deformity."

THE CHAIRMAN: Is this change acceptable to the Section? There seems to be no dissent, and it is declared adopted.

MR. SHEPPARD: We made no changes in sections 16 and 17. In the sixth paragraph of section 18, we have made a modification which merely brings it into consonance with section 15. We have stricken out after the word "deformity" in the 4th line the words "without having first procured from the board of pharmacy the license specified in," and have inserted in lieu thereof the words "contrary to the provisions of," so that the reading will be, "Whoever shall sell or offer for sale," etc., "any implement or appliance for the treatment of disease, injury or deformity, *contrary to the provisions of* Sec. Fifteen of this act, shall be deemed guilty," etc.

No dissent. Adopted.

MR. SHEPPARD: In the last paragraph of section 18, 3d and 6th lines, between the words "any" and "title," insert the word "other"—"or any *other* title of similar import," etc.

No dissent. Adopted.

MR. SHEPPARD: These are all the changes.

On motion of Mr. Stewart, seconded by Mr. Remington, the draft of a model pharmacy law as amended was now adopted as a whole.

Said draft as amended is as follows:

A GENERAL FORM OF PHARMACY LAW SUITABLE FOR ENACTMENT BY THE SEVERAL STATES OF THE UNITED STATES.

BY J. H. BEAL, SCIO, O.

CONCERNING THE SALE OF DRUGS BY UNLICENSED PERSONS.

SEC. 1. It shall be unlawful for any person not licensed as a pharmacist within the meaning of this act to own, conduct or manage any pharmacy, drug or chemical store, apothecary shop, or other place of business for the retailing, compounding or dispensing of any drugs, chemicals or poisons, or for the compounding of physicians' prescriptions, or to keep exposed for sale at retail any drugs, chemicals or poisons, except as hereinafter provided, or for any person not licensed as a pharmacist or assistant pharmacist within the meaning of this act to compound, dispense, or sell at retail any drug, chemical, poison, or pharmaceutical preparation upon the prescription of a physician, or otherwise, or to compound physicians' prescriptions, except as an aid to or under the supervision of a person licensed as a pharmacist under this act. And it shall be unlawful for any owner or manager of a pharmacy, or drug store, or other place of business, to cause or permit any other than a person licensed as a pharmacist or assistant pharmacist to compound, dispense or sell, at retail, any drug, medicine or poison, except as an aid to or under the supervision of a person licensed as a pharmacist or assistant pharmacist.

Provided, however, that nothing in this section shall be construed to interfere with any legally registered practitioner of medicine or dentistry in the compounding of his own prescriptions, or to prevent him from supplying to his patients such medicines as he may deem proper, nor with the exclusively wholesale business of any dealer who shall be licensed as a pharmacist or who shall keep in his employ at least one person who is licensed as a pharmacist, nor with the selling at retail of non-poisonous domestic remedies, nor with the sale of patent or proprietary preparations which do not contain poisonous ingredients, nor with the sale of poisonous substances which are sold exclusively for use in the arts, or for use as insecticides, when such substances are sold in unbroken packages bearing a label having plainly printed upon it the name of the contents, the word Poison, and the names of at least two readily obtainable antidotes.

Provided further that in any village of not more than 500 inhabitants where there is no person licensed as pharmacist within less than two miles of such village, the Board of Pharmacy may grant to any person who is licensed as assistant pharmacist a permit to conduct a drug store or pharmacy in such village, which permit shall not be valid in any other village than the one for which it was granted, and shall cease and determine when

the population of the village for which such permit was granted shall become greater than 500; and, provided also, that in rural districts where there is no person licensed as pharmacist or assistant pharmacist within less than two miles the Board of Pharmacy may issue permits to dealers in general merchandise to sell such drugs and medicines as may be specified by the Board, which permit shall run for a period of two years.

Within the meaning of this act, rural districts are villages or other places of not more than 200 inhabitants.

CONCERNING EXAMINATIONS AND REGISTRATION.

SEC. 2. Every person now licensed or registered as a pharmacist or assistant pharmacist under the laws of this State shall be entitled to continue in the practice of his profession until the expiration of the term for which his certificate of registration or license was issued. Every person who shall hereafter desire to be licensed as a pharmacist or assistant pharmacist shall file with the Secretary of the Board of Pharmacy an application, duly verified under oath, setting forth the name and age of the applicant, the place or places at which, and the time spent in the study of the science and art of pharmacy, the experience in the compounding of physicians' prescriptions which the applicant has had under the direction of a legally licensed pharmacist, and shall appear at a time and place designated by the Board of Pharmacy and submit to an examination as to his qualifications for registration as a licensed pharmacist or assistant pharmacist.

SEC. 3. In order to be licensed as a pharmacist within the meaning of this act an applicant shall be not less than 21 years of age, and shall have been licensed as an assistant pharmacist for not less than two years prior to his application for license as a pharmacist, and he shall present to the Board satisfactory evidence that he is a graduate of a reputable school or college of pharmacy, and that he has had four years' experience in pharmacy under the instruction of a licensed pharmacist, and he shall also pass a satisfactory examination by or under the direction of the Board of Pharmacy.

In order to be licensed as an assistant pharmacist within the meaning of this act an applicant shall be not less than 18 years of age, shall have a sufficient preliminary general education, and shall have not less than two years' experience in pharmacy under the instruction of a licensed pharmacist, and shall pass a satisfactory examination by or under the direction of the Board of Pharmacy.

Provided, however, that in the case of persons who have attended a reputable school or college of pharmacy the actual time of attendance at such school or college of pharmacy may be deducted from the time of experience required of pharmacists and assistant pharmacists, but in no case shall less than two years' experience be required for registration as a licensed pharmacist.

SEC. 4. If the applicant for license as a pharmacist or assistant pharmacist has complied with all the requirements of the two preceding sections, the Board of Pharmacy shall enroll his name upon the register of pharmacists or assistant pharmacists and issue to him a license which shall entitle him to practice as pharmacist or assistant pharmacist for a period of two years from the date of the said license.

The Board of Pharmacy may refuse to grant a license to any person guilty of felony or gross immorality, or who is addicted to the use of alcoholic liquors or narcotic drugs to such an extent as to render him unfit to practice pharmacy; and the Board of Pharmacy may, after due notice and hearing, revoke a license for like cause, or any license which has been procured by fraud.

An appeal from the action of the Board in refusing to grant or in revoking a license for such cause may be taken to the Governor and Attorney-General, the decision of which officers, either affirming or over-ruling the action of the Board, shall be final.

SEC. 5. The Board of Pharmacy may issue licenses to practice as pharmacists or assistant pharmacists in this State, without examination, to such persons as have been legally registered or licensed as pharmacists or assistant pharmacists in other States or foreign countries, provided that the applicant for such license shall present satisfactory evidence of qualifications equal to those required from licentiates in this State, and that he was registered or licensed by examination in such other State or foreign country, and that the standard of competence required in such other State or foreign country is not lower than that required in this State, and provided also that the Board is satisfied that such other State or foreign country accords similar recognition to the licentiates of this State.

Applicants for license under this section shall with their application forward to the Secretary of the Board of Pharmacy the same fees as are required of other candidates for license.

SEC. 6. Every certificate of license to practice as pharmacist or assistant pharmacist, and every permit to an assistant pharmacist to conduct a drug store in villages of not more than 500 inhabitants, and every permit issued to dealers in general merchandise in rural districts to sell a list of drugs and medicines prescribed by the Board of Pharmacy, and every renewal of such license or permit shall be conspicuously exposed in the pharmacy or drug store or place of business of which the pharmacist or assistant pharmacist or other person to whom it is issued is the owner or manager, or in which he is employed.

Every licensed pharmacist or assistant pharmacist who desires to continue in the practice of his profession, and every person holding a permit to sell drugs in rural districts shall, within thirty days next preceding the expiration of his license or permit, file with the Board an application for the renewal thereof, which application shall be accompanied by the fee

hereinafter prescribed. If the Board shall find that the applicant has been legally licensed in this State and is entitled to a renewal of license, or to a renewal of such permit, it shall issue to him a certificate attesting that fact

If any pharmacist or assistant pharmacist shall fail, for a period of sixty days after the expiration of his license, to make application to the Board for its renewal, his name shall be erased from the register of licensed pharmacists or assistant pharmacists, and such person in order to again become registered as a licensed pharmacist or assistant pharmacist, shall be required to pay the same fee as in the case of original registration. And if any holder of a permit to sell drugs in rural districts shall fail for a period of sixty days after the expiration of his permit to make application for the renewal thereof, his name shall be erased from the register of persons holding such permits, and may be restored thereto only upon the payment of the fee required for the granting of original permits. The name of the responsible manager of every pharmacy, drug store or apothecary shop shall be conspicuously displayed upon the outside of such place of business.

CONCERNING THE BOARD OF PHARMACY.

SEC. 7. The Board of Pharmacy shall consist of five persons licensed as pharmacists and actively engaged in the practice of pharmacy within this State who shall be appointed by the Governor, by and with the advice of the ———, and who shall hold their office for five years from the date of their appointment, and until their successors shall have been appointed and qualified. The members of the Board first appointed shall hold their offices for one, two, three, four and five years respectively, as shall be designated in their several commissions.

Annually the ——— Pharmaceutical Association may submit to the governor the names of five persons licensed as pharmacists, within this State, and from this number, or from others, the governor, by and with the advice of the ———, shall appoint one member to fill the vacancy annually occurring in the Board of Pharmacy, and vacancies occurring from any other cause shall be filled in like manner.

The members of the present Board of Pharmacy shall continue in office until the expiration of their respective terms, and the vacancies thus occurring shall be filled as previously designated.

SEC. 8. Annually the Board of Pharmacy shall organize by the election of a president and secretary, both of whom shall be members of the Board, who shall hold their offices for one year and until their successors shall have been elected and qualified.

The Secretary shall give a bond in such sum as may be prescribed by the Board, conditioned upon the discharge of the duties of his office according to law.

The Board shall hold four meetings each year at ———, at such times

and places as it may provide by rule, for the examination of candidates, and for the discharge of such other business as may legally come before it, and such additional meetings as may be necessary.

SEC. 9. The Board of Pharmacy shall have a common seal, and shall have power to adopt such rules and by-laws, not inconsistent with law, as may be necessary for the regulation of its proceedings, and for the discharge of the duties imposed under this statute, and shall have power to employ an attorney to conduct prosecutions or to assist in the conduct of prosecutions under this act.

The Board shall keep a record of its proceedings and a register of all persons to whom certificates of license as pharmacists and assistant pharmacists and permits have been issued, and of all renewals thereof: and the books and register of the Board, or a copy of any part thereof certified by the Secretary, attested by the seal of the Board, shall be accepted as competent evidence in all the courts of this state.

The Board of Pharmacy shall make annually to the governor and to the ——— Pharmaceutical Association a written report of its proceedings and of its receipts and disbursements under this act, and of all persons licensed to practice as pharmacists and assistant pharmacists in this state. A majority of the Board shall constitute a quorum for the transaction of business.

The President and Secretary shall have the power to administer oaths in all matters pertaining to the examination and registration of pharmacists and assistant pharmacists.

SEC. 10. The Secretary shall receive such salary as may be prescribed by the Board of Pharmacy, and his necessary expenses while engaged in the performance of his official duties. The other members shall receive the sum of five dollars for each day actually employed in the discharge of their official duties, and their necessary expenses while engaged therein.

All fees collected by the Secretary for the examination of pharmacists and assistant pharmacists, and for the issuing of the permits authorized by this act, and for the renewal of certificates of registration and permits, and all fines collected under prosecutions begun or caused to be begun by the Board of Pharmacy, and all other funds collected under this act shall by him be covered into the State treasury monthly, and shall be placed to the credit of a fund which is hereby appropriated for the use of the Board of Pharmacy.

The compensation and expenses of the Secretary and members of the Board of Pharmacy, and all expenses incurred by the Board in carrying into execution the provisions of this act shall be paid out of said fund upon the warrant of the Auditor of State, issued upon requisition, signed by the President and Secretary of the Board.

SEC. 11. Upon receiving information that any provision of this law has been or is being violated, the Secretary of the Board of Pharmacy shall investigate the matter, and upon probable cause appearing, shall, under

direction of the Board, file a complaint and prosecute the offender therefor.

It shall be the duty of the prosecuting attorney, upon request of the Secretary, to take charge of and conduct such prosecutions.

All fines assessed and collected under prosecutions begun or caused to be begun under this act shall be paid to the Secretary, and by him covered into the State treasury monthly, and shall be credited to the fund for the use of the Board of Pharmacy.

SEC. 12. The Board of Pharmacy shall be entitled to charge and collect the following fees: For the examination of an applicant for license as a pharmacist, $10.00; for the examination of an applicant for license as an assistant pharmacist, $5.00; for renewing the license of a pharmacist, $1.00; for renewing the license of an assistant pharmacist, $0.50; for issuing a permit to an assistant pharmacist to conduct a drug store in villages of not more than 500 inhabitants, $2.00; for issuing a permit to dealers in general merchandise to sell certain drugs in rural districts, $2.00, and for the renewal thereof, $1.00.

All fees shall be paid before any applicant may be admitted to examination or his name placed upon the register of pharmacists or assistant pharmacists, or before any license or permit, or any renewal thereof, may be issued by the Board.

CONCERNING THE SALE AND REGISTRATION OF POISONS.

SEC. 13. It shall be unlawful for any person to sell or deliver to any minor under sixteen years of age, except upon the written order of an adult, or to sell or deliver to any person any of the following described substances, or any poisonous compound, combination or preparation thereof, to wit: The compounds and salts of antimony, arsenic, barium, chromium, copper, gold, lead, mercury, silver and zinc, the caustic hydrates of sodium and potassium, solution or water of ammonia, the concentrated mineral acids, oxalic and hydrocyanic acids and their salts, yellow phosphorus, paris green, carbolic acid, the essential oils of almonds, pennyroyal, tansy and savin, croton oil, creosote, chloroform, chloral hydrate, cantharides, or any aconite, belladonna, bitter almonds, colchicum, cotton root, cocculus indicus, conium, cannabis indica, digitalis, hyoscyamus, ignatia, lobelia, nux vomica, opium, physostigma, phytolacca, strophanthus, stramonium, veratrum viride, or any of the poisonous alkaloids or alkaloidal salts or other poisonous principles derived from the foregoing, or cocaine and veratrine or any other poisonous alkaloids or their salts, or any other virulent poison, except in the manner following:

It shall first be learned by due inquiry that the person to whom delivery is made is aware of the poisonous character of the substance, and that it is desired for a lawful purpose, and the box, bottle, or other package shall be plainly labeled with the name of the substance, the word Poison, the name of the person or firm dispensing the substance, and the names of two

or more substances which may be used as antidotes. And before a delivery shall be made of any of the foregoing substances there shall be recorded in a book kept for the purpose the name of the article, the quantity delivered, the purpose for which it is alleged to be used, the date of delivery, the name and address of the purchaser, and the name of the dispenser, which book shall be preserved for at least five years, and shall at all times be open to inspection by the proper officers of the law.

Provided, however, that the foregoing provisions shall not apply to articles dispensed upon the order of persons believed by the dispenser to be lawfully authorized practitioners of medicine or dentistry, and provided, also, that the record of sale and delivery above mentioned shall not be required of manufacturers and wholesalers who shall sell any of the foregoing substances at wholesale, but the box, bottle, or other package containing such substance when sold at wholesale shall be properly labeled with the name of the substance, the word Poison, and the name and address of the manufacturer or wholesaler.

And it is further provided that it shall not be necessary to place a poison label upon nor to record the delivery of the sulfid of antimony, or the oxid or carbonate of zinc, or of colors ground in oil and intended for use as paints, or calomel, paregoric, or other preparations of opium containing less than two grains of opium to the fluid ounce, nor in the case of preparations containing any of the substances named in this section when a single box, bottle, or other package, or when the bulk of two fluid ounces or the weight of two avoirdupois ounces, does not contain more than an adult medicinal dose of such poisonous substance.

GENERAL PROVISIONS.

Sec. 14. Every proprietor or manager of a drug store or pharmacy shall keep in his place of business a suitable book or file in which shall be preserved for a period of not less than five years the original of every prescription compounded or dispensed at such store or pharmacy. Upon request the proprietor or manager of such store shall furnish to the prescribing physician, or to the person for whom such prescription was compounded or dispensed, a true and correct copy thereof, and said book or file of original prescriptions shall at all times be open to inspection by duly authorized officers of the law.

Sec. 15. It shall be unlawful for any person to sell or to offer for sale by peddling, or to offer for sale from house to house, or to offer for sale by public outcry or by vending in the street, any drug, medicine, chemical, or any composition or combination thereof, or any implement or appliance or other agency for the treatment of disease, injury or deformity.

Sec. 16. It shall be unlawful for any person not legally licensed as a pharmacist to take, use or exhibit the title of pharmacist, or licensed or registered pharmacist, or the title druggist, or apothecary, or any other

title or description of like import; and it shall be unlawful for any person not legally licensed as an assistant pharmacist to take, use or exhibit the title of assistant pharmacist, or any other title or description of like import.

Sec. 17. All persons licensed under this act as pharmacists or assistant pharmacists and actively engaged in the practice of their profession shall, be free and exempt from jury duty in all the courts of this state.

Sec. 18. Whoever, not being licensed as a pharmacist, shall conduct or manage any drug store, pharmacy, or other place of business for the compounding, dispensing or sale at retail of any drugs, medicines or poisons, or for the compounding of physicians' prescriptions, contrary to the provisions of Section *One* of this act shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined not less than $25.00 nor more than $100.00, and each week such drug store or pharmacy, or other place of business is so unlawfully conducted shall be held to constitute a separate and distinct offense.

Whoever, not being licensed as a pharmacist or assistant pharmacist, shall compound, dispense, or sell at retail any drug, medicine, poison or pharmaceutical preparation, either upon a physician's prescription or otherwise, and whoever being the owner or manager of a drug store, pharmacy, or other place of business, shall cause or permit any one not licensed as a pharmacist or assistant pharmacist to dispense, sell at retail, or compound any drug, medicine, poison or physician's prescription contrary to the provisions of Section *One* of this act, shall be deemed guilty of misdemeanor, and upon conviction thereof shall be fined not less than $10.00 nor more than $100.00.

Any license or permit or renewal thereof obtained through fraud or by any false or fraudulent representation shall be void and of no effect in law. Any person who shall make any false or fraudulent representation for the purpose of procuring a license or permit or renewal thereof, either for himself or for another, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than $25.00 nor more than $100.00, and any person who shall willfully make a false affidavit for the purpose of procuring a license or permit or renewal thereof, either for himself or for another, shall be deemed guilty of perjury, and upon conviction thereof shall be subject to like punishment as in other cases of perjury.

Whoever, being the holder of any license or permit granted under this act shall fail to expose such license or permit or any renewal thereof in a conspicuous position in the place of business to which such license or permit relates, or in which the holder thereof is employed, contrary to the provisions of Section *Six* of this act, shall, upon conviction thereof, be fined not less than $5.00 nor more than $25.00, and each week that such license, permit or renewal shall not be exposed, shall be held to constitute a sepa-

rate and distinct offense. And whoever, being the holder of any license or permit granted under this act, shall, after the expiration of such license or permit, and without renewing the same, continue to carry on the business for which such license or permit was granted, contrary to the provisions of Section *Six* of this act, shall, upon conviction thereof, be fined not less than $5.00 nor more than $25.00.

Whoever shall sell or deliver to any person any poisonous substance specified in Section *Thirteen* of this act, without labeling the same and recording the delivery thereof in the manner prescribed in said Section *Thirteen*, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not less than $10.00 nor more than $100.00.

Whoever shall sell or offer for sale by peddling from house to house, or offer for sale by public outcry or by vending in the street, any drug, medicine, chemical or combination thereof, or any implement or appliance for the treatment of disease, injury or deformity, contrary to the provisions of Section *Fifteen* of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than $25.00 nor more than $200.00.

Whoever, not being legally licensed as a pharmacist, shall take, use, or exhibit the title of pharmacist, licensed or registered pharmacist, druggist, apothecary, or any other title of similar import, contrary to the provisions of Section *Sixteen*, of this act, and whoever, not being legally licensed as an assistant pharmacist, shall take, use, or exhibit the title of assistant pharmacist, or any other title of similar import, contrary to the provisions of said Section *Sixteen*, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than $10.00 nor more than $50.00.

SEC. 19. This act shall be in force from and after its passage, and all acts or parts of acts in conflict with this act, shall be and the same are hereby repealed.

MR. ALPERS: I have a motion here by Mr. Oldberg, which I desire to present:

Moved, that a Committee of three be appointed by the Chairman to communicate with the State Boards of Pharmacy, the State Pharmaceutical Associations and others, calling their attention to this draft of a proposed pharmacy law, and to make earnest efforts with the view to effect its adoption.

MR. SHEPPARD: I move to amend to a committee of three, of which Mr. Beal shall be Chairman.

MR. ALPERS: Certainly, that amendment is accepted.

MR. PRESCOTT: I should like to hear a word or two from Mr. Beal as to the advisability of pharmacists trying to get this law adopted, or getting their present laws on pharmacy amended to coincide with this law in States where the pharmacists believe they have fairly good laws on the whole.

MR. SHEPPARD: I should like Mr. Beal to tell us also his ideas in regard to the desirability of inserting foot-notes in the law.

MR. PRESCOTT: In Michigan the Committee on Legislation of the State Pharmaceutical Association have for the last four or five years past — at least three sessions of the Legislature—had carefully prepared amendments to our law, made with much deliberation by the Committee and adopted by the Association, which it was distinctly understood, and the Committee was so instructed, were not to be introduced unless bills to amend the law were introduced by others inimical to the interest of the pharmacists: but if that was done, then they were to push these amendments, so that we might not be injured by thoughtless or prejudicial legislation.

MR. WHELPLEY: I would like to ask Mr. Beal whether, in his judgment, it would not be well to accompany the distribution of these reprints with a letter embodying notes on some of the more important questions that have been asked during our discussions? No doubt when this bill is received by the various pharmacists of the country they will naturally like to ask questions similar to those that have been propounded in discussing the bill; and Mr. Beal being familiar with all the discussions, would be in a position to answer many of these questions in advance.

MR. BEAL: Answering Mr. Prescott first, we do not hope that any Legislature will take this law up, either in whole or in part, and adopt it, and we should be well satisfied to leave matters as they are where we have fairly satisfactory laws. But we want something ready when the Philistines do come after us. It is my idea also that this pamphlet when issued should be accompanied by a few footnotes, as suggested by Mr. Sheppard and Mr. Whelpley. I do not think these notes should be too extensive, but they should be sufficiently explicit, so that they would not undertake to pass a law just as this is here, and get into a wrangle. Most of the opposition to pharmaceutical legislation comes from the pharmacists themselves. The general public, as a rule, is comparatively indifferent. The average legislator is to a certain extent indifferent, and pretty generally honest in his desire to do what is best for the people. They want to be convinced, most of them, that there is no doubt of the correctness of the proposed legislation—that it is all right—and if it is, and they are solicited in the right way, and protests are not sent in by pharmacists from all over the State — as they frequently are, either openly or on the quiet — the bill will probably be passed. It is bad policy, however, to try to get everything at once.

The motion to place the model pharmacy law before the State Boards of Pharmacy and the State Associations was carried.

The chair appointed Messrs. Beal, Alpers and Sheppard a committee to carry out the purposes of the resolution.

MR. WHELPLEY: I move that we extend a hearty vote of thanks to the Committee on a Model Pharmacy law—which is really Mr. Beal—for the excellent work done on this law.

The chair stated that it was but just and right that this should be done, and the motion was unanimously carried.

MR. BEAL: Gentlemen, I thank you for your kindness, and for the very liberal assistance which you have all given me. I have made very free use of all the information which has come to my hands—of the reports and papers of Mr. Hallberg, Mr. Oldberg, and of many other members of the Association. I thank them all gratefully, and I think a large measure of the thanks you have tendered me should be made to apply to them.

THE CHAIRMAN: The next thing in order is the report of the Committee on Chairman's Address.

Mr. Hallberg read the report as follows:

REPORT OF COMMITTEE ON CHAIRMAN'S ADDRESS.

We heartily commend the able address of the Chairman, and in relation to the suggestions contained therein we recommend as follows:

1. We approve of the suggestion that all expenses of administering pharmacy laws should be met by those whom they are intended to benefit, viz., the public.

2. We recommend that none beside graduates in pharmacy be licensed to practice pharmacy.

3. While the State Pharmaceutical Association cannot dictate to the appointing power, it should, nevertheless, exercise its prerogative by naming suitable persons for positions on the State Boards of Pharmacy.

4. We approve of the idea of clinical conferences, and hope the method may be extended.

5. Uniformity in the labeling of fluid extracts and similar products is recommended.

6. We recommend that the prices of prescriptions be plainly marked in Arabic figures on copies of prescriptions.

7. While heartily in favor of giving pharmacists every opportunity of rest and recreation on Sunday, the question of Sunday closing is largely influenced by local considerations.

The expression anent the lack of appreciation of the work of pharmaceutical colleges is timely. It is to be deplored that medical education is of so little interest to the lay public; while munificent support is given to education in other professions, medicine, and pharmacy as one of its branches, has always been regarded as self-supportive; that the question of medical education—so closely related to the health of the people—deserves more substantial recognition in the immediate future is our earnest belief.

C. S. N. HALLBERG,
F. W. E. STEDEM,
F. E. STEWART.

On motion of Mr. Remington, the report was adopted.

THE CHAIRMAN: Mr. Caspari desires to present a paper to the Section, which he will explain.

MR. CASPARI: I want to present in abstract a paper which has come to us from Europe from one of our honorary members. It cannot be read in detail at this time, but I wish to call attention to it as an educational factor, so that you will have a better appreciation of it when it appears in the Proceedings. The title of the paper is, "A Plea for a National Library and Museum of the History of Chemistry and Cognate Arts and Sciences," by Dr. Fred Hoffmann, of Berlin. It is a paper that will bear reading carefully, and I think it will interest our members; and it is possible that members who have old and rare books in their possession will be inclined to place them at some central point where access can be had to them.

After the leading features of the paper had been explained, and certain portions of it read in abstract, on motion of Mr. Prescott, the paper was received and referred for publication.

The following is the full text of the paper:

A PLEA FOR A NATIONAL LIBRARY AND MUSEUM OF THE HISTORY OF CHEMISTRY AND COGNATE ARTS AND SCIENCES.

BY FRED. HOFFMANN.

It is a matter for rejoicing that not only the principal American universities and various institutes, but also a number of professional colleges, among them those of medicine and pharmacy, have accumulated and are in the possession of more or less comprehensive libraries and museums, and that they are aiming at their constant enlargement and completion. Such libraries and museums cannot fail to become more and more potent auxiliaries in the educational and literary objects of these institutions as well as an efficient factor for the advancement of American scholarship and culture.

Most of these libraries are of comparatively recent origin, and generally embrace the pertinent scientific and professional literature of modern times, but rarely contain any considerable number of works of past centuries. Such older books are scarcely any longer in the book market, and are rarely available except by chance, as is particularly the case with works that specially relate to the remoteness of the history of alchemy, of pharmacy, materia medica, spices, etc. Whoever has had experience in the fascinating study in these domains of historical research will be familiar with the difficulty of finding in any one of the great European libraries an approximately complete collection of the extant literature of all ages. There is quite a difference in this respect among the foremost libraries; they are mostly well provided with the general literature of the past, but are more or less deficient in the special domain of historical records. But in the multiplicity of the great book collections, particularly in Germany, libraries specially rich in ancient works relating to the history of materia medica, alchemy and pharmacy are sometimes located in close proximity and even in one city, like the comprehensive historical libraries of the German National Museum and that of the municipality at Nuremberg, the University and the City libraries at Leipzig, and the various great libraries in Berlin, London and Paris. Shortcomings of this kind in the various European libraries are of less consequence to the student, as the distances in Central Europe are not considerable, and as books are distributed on loan by mail by most libraries.

It is, however, difficult in a younger civilization, and in a country of so vast an extent as the United States, where the prevailing multiplication of libraries on the one hand, and the increasing scarcity of available books of remoter ages on the other hand, tend to constantly increase these difficulties. The stock of ancient works in these domains of history is rapidly being absorbed by the older standing libraries, and is becoming scarcer and less available from century to century. As these works are of permanent value and indispensable in historical research and study, it should be the

common aim of American scientists interested in the history of applied chemistry, of medicine, pharmacy and materia medica, to conscientiously gather, preserve, and, as much as possible, to unite whatever much or little of such ancient books has been accumulated in American book collections, with a view of ultimately consolidating the scattered parcels of these literary treasures into one American historical library of chemistry and cognate sciences and arts, instead of leaving them dispersed and hidden in a multitude of petty, private book collections.

Such a desideratum might be realized by the initiative and joint action of the American Chemical Society, of the American Association for the Advancement of Science, and of the American Pharmaceutical Association, and should be undertaken in time. An excellent and rare chance, perhaps never to become available again, is fortunately close at hand. The various university and other public libraries may possess some stray volumes of such historical literature, and in the common interest may consent to transfer them to a central historical library of chemical and cognate literature. But the main stock for the foundation of such a library might be obtained sooner or later by the acquisition and the consolidation of two collateral historical libraries of superior extent and value, accumulated by individual efforts and means during many years of unostentatious, patient and discriminating collecting. They are the comprehensive libraries of Professor H. Carrington Bolton, in Washington, D. C., and of Professor John Uri Lloyd and Mr. Curtis G. Lloyd, in Cincinnati, O., the former embracing especially the history of alchemy and chemistry, the latter that of materia medica, pharmacy and botany.

By themselves and in the prevailing drift of indiscriminate multiplication of public and private libraries these two choice libraries would perhaps pass to coming generations as uncommonly valuable yet separate and fragmentary book collections in a special domain of historical bibliography, and would hardly ever attain to a maximum of usefulness. When united and subsequently completed by further additions in the way of purchases, donations and bequests, they will form in the course of years a National historical library of chemistry and materia medica unequaled in America, and on a par with other kindred achievements of American enterprise and munificence. This would add a potent factor for fostering that "historical sense" so much appreciated in European civilization and culture, and largely needed in the materialistic drift prevailing in our country and time. Nor would American students of the remoter eras of the history in these domains of knowledge and application any longer be obliged to resort for historical researches to the libraries of foreign countries.

Another somewhat correlated subject is the collection and preservation of historical articles of all kinds relating to the history of chemistry, pharmacy and materia medica, as well as mementoes of men eminent in these domains of application. Whoever is familiar with the valuable and inter-

esting historical collections of this kind in the ethnographic and art museums of the European capitals, of the National Museum at Nuremberg, and a number of continental public and private collections, will appreciate their usefulness and significance. How many interesting relics of eminent chemists and naturalists of the past are still astray and concealed in family and private custody, perhaps never to be gathered in accessible collections as mementoes to coming generations! On the occasion of the annual meeting of the Swiss Pharmaceutical Society at Bern in August, 1898, there was in addition to the customary display of apparatus and implements an exhibit of miscellaneous objects left by the late Dr. Fred. Flückiger, until 1891 professor of pharmaceutical chemistry and pharmacognosy at the University of Strassburg, and one of the foremost scholars and writers in these special domains. It comprised laboratory apparatus, manuscripts, rare books, diplomas, medals and various other objects of historical interest, and demonstrated impressively the value and usefulness of collections of this kind.

Throughout the United States there is undoubtedly scattered a large number of similar objects and specimens of paramount and historical interest and significance left by departed naturalists and students, partly emigrants from European and Central American States, which after the demise of their owners have passed to succeeding generations, perhaps as little understood and appreciated, obsolete relics. The majority of such articles, even of more recent American investigators and scholars, sooner or later sink into oblivion and frequently are lost. When gathered by purchase, donation and bequest, and collected and preserved in one museum, they would form a comprehensive collection, valuable and instructive for the history of chemistry and pharmacy, as well as of their foremost representative men of the past.

Some such stray relics are found in a number of the collections of American institutes, universities, colleges of pharmacy, etc., and also in the materia medica collection of the National Museum at Washington. They are the few remaining implements of Joseph Priestley, from his kitchen laboratory in Northumberland, Pa., which will be remembered by the surviving American chemists who on August 1, 1874, assembled at that secluded village in the beautiful Susquehanna valley in centennial commemoration of the discovery of oxygen. Many interesting objects from the laboratories and studies of American chemists and naturalists of the departing century, as well as an abundance of documents consisting of books, diplomas, medals, manuscripts, correspondence, etc., now scattered and concealed on the shelves of college museums and in domestic shrines, when gathered and united in a national museum, would at once and still more in time to come form a memorable and most valuable and interesting collection to which the older generation of still living American chemists and scientists would not fail sooner or later to contribute their share.

In this way a historical library and museum of chemistry, pharmacy and cognate sciences and arts could be realized in the course of time, which from the start would bear the impress of a national character, and which in interest and value may soon surpass the existing corresponding European libraries and museums.

These random suggestions may be in place and in time at the dawn of a new century. They may also serve as a timely warning to all interested in this matter against dispersing the historical literary treasures and relics of the past, and against the untoward multiplication of petty and inadequate historical libraries and collections met with in the old and not less in the new world.

Berlin, Germany, April, 1900.

MR. STEDEM: I have here a set of resolutions we are asked to concur in, coming from the Pharmacopœial Convention of last week:

WHEREAS, There are at present no adequate facilities provided by the government for the verification of standards and standard measuring apparatus, certain classes of which are daily used by pharmacists; and,

WHEREAS, Other governments do provide such facilities, this resulting in the importation of foreign made apparatus; therefore, be it

Resolved, That the American Pharmaceutical Association express its approval of the steps taken to establish a national standardization bureau.

Resolved further, That copies of these resolutions be transmitted to the Secretary of the Treasury, the President of the Senate, the Speaker of the House of Represedtatives, and to the Chairman of the House Committee on Coinage, Weights and Measures.

On motion of Mr. Prescott, seconded by Mr. Sheppard, the resolutions were adopted.

THE CHAIRMAN: I believe the Commercial Section referred to us for consideration the question of a commercial training in colleges of pharmacy, as presented there by Mr. Ryan, but Mr. Ryan is not now in the room, and we will have a paper by Mr. Alpers on "Preliminary Education for Students of Colleges of Pharmacy."

MR. ALPERS: A somewhat higher standard may be set up here than will be approved by some of you, but that is a matter you will have to judge for yourselves. I should say, also, that I am not the author of this paper, as published here; it is the report of the committee appointed last year for this special purpose. The printer thought it was my personal work, and put my name to the printed copies.

Mr. Alpers then read the paper as follows:

REPORT ON PRELIMINARY EDUCATION FOR STUDENTS OF PHARMACY.

In trying to establish a measure and standard of preliminary education for our pharmaceutical colleges, it is well to first consider the meaning of the word "College." Whosoever has watched the development of our great educational institutions during the last decade has noticed the tendency among the larger ones to evolve from a mere academic college to a general university, that is, a combination of schools for special professional training. But wherever this change has been accomplished, great care is taken to put more or less severe restriction on the admission into these

special schools. It is not considered a waste of time to spend a number of years in the so-called College proper—the purely academic school without specialization—to train the mind on a broad foundation of general knowledge, and let the student breathe the free atmosphere of professional science and practice, which will secure him in later years against degrading narrowness and total atrophy. The necessity, recognized for centuries in European countries, that the student must be *broadened* before he can *specialize*, is now also recognized by all true educators in our country. Special professional knowledge, be it medicine, law, theology, engineering or any other, following the general academic education, may be compared to a lofty pinnacle over a work of architecture; it matters little whether it rises as a cupola, tower, dome, spire or steeple, it always needs a solid base, a sound foundation to make it secure and permanent. If this broad foundation is lacking when specialization begins, the student is compelled to rely on his memory rather than on logical deduction, and cramming must take the place of reasoning. But nothing is more pernicious in theory and practice than to give a student the impression that higher education is simply a matter of training the memory or has any analogy to a permanent cramming process.

To what extent do our Pharmaceutical Colleges fulfil these conditions? By reading their announcements we might think that at least some pay due regard to preliminary education, and exclude illiterate applicants. In 6 schools of pharmacy there are no entrance requirements; in 4 schools they are indefinite; 24 demand a grammar school education; 11, 6 and 1 require respectively one, two and three years of high-school work. In reality, however, an applicant is hardly ever rejected, and the preliminary requirements of the prospectus are little more than pia desideria. From the correspondence that the committee had with many members of pharmaceutical colleges, we know this to be a fact; even teachers of schools that are connected with state universities write that "we try to live up to the requirements," which is only a disguised way of saying, "we do *not* live up to them." This fact is confirmed by members of State Boards of Pharmacy, who again and again complain of the lack of general education of candidates who come before them with diplomas from the most reputable colleges of pharmacy. The excuses for disregarding these fundamental conditions are numerous; but the very fact that the representatives of nearly every college are quick in offering excuses shows that they fully recognize the error of their ways, but lack the courage or ability to institute reforms. Some colleges have lately tried to raise their standard by conferring an additional higher degree on those who will go through a post-graduate course. While the addition of new courses of study is always commendable, the conferring of such a degree on young men without academic education can have but one result—namely, the lowering of its value. The root of the evil is not affected by it.

We also know that our Pharmaceutical Colleges are based on various widely differing methods of management and depend for their support on different factors; some are branches of State Universities; others are private institutions of ambitious men; others are stock companies founded for the purpose of making money; others are supported by a large number of members, generally pharmacists, who contribute more or less to their support, without expectation of any return or thanks.

The same diversity exists among the teachers; some are men practically trained in universities abroad or at home for their difficult positions; some devote all their time and work to the advancement of their college and thereby of pharmacy in general; but the larger number are men who without any academic training devote but a few hours a week to teaching and spend the greater part of their time in their own business, where their main interest must naturally lie. In addition to these varying conditions we must not forget that there is no national authority in the United States that can prescribe standards for degrees or for licenses to practice the professions. Each State makes its own professional laws. As a result there are almost as many standards as there are political divisions. The desirability of uniform standards throughout the country for admission to professional practice is recognized generally, but varying conditions as to density of population, educational advantages and general development make it impracticable to hope for the attainment of this end for some time to come. (Report of the Regents of New York, 1899.)

It is rather a peculiar phenomenon that the requirements of a preliminary general education, although first in importance for the success and reputation of a college, are latest in development and least in legal recognition; but there can be no doubt that this must be the most important line of future development of every school and particularly of the pharmaceutical schools. In the State of New York, where the beneficial influence of the Regents is felt in all higher educational branches, efforts have been made, not without success, to establish a stable base and a unit of measure for preliminary requirements and to legally define the word "College." It is worth while to quote in this respect from the Regents' report:

"Admission to a high school presupposes at least eight years of common "school or preacademic work and the completion of arithmetic, geogra- "phy, grammar, reading, spelling and writing on examination. The "minimum requirements for each high school year are three prepared and "one unprepared academic subject forty-five minutes daily, five days a "week, forty weeks a year; the maximum four prepared and one unpre- "pared academic subject as above; less than the minimum cannot be "recognized, more than the maximum cannot be accomplished; prepared "subjects require preparation outside of recitation periods, unprepared "during the period.

"The Court of Appeals and the Regents of the University of the State "of New York both refuse to recognize as a college or university an insti- "tution which, though taking the name, in reality does work of a lower "grade. Colleges of medicine, pharmacy, dentistry, business colleges and "all similar professional and technical schools are not registered as col- "leges. By college is understood an institution which requires for admis- "sion four years of academic or high school preparation, in addition to "the pre-academic or grammar school studies, and which gives four "full years of college instruction as a condition of graduation. Institu- "tions with courses equivalent to three years of college work are some- "times registered when they require four full years of academic prepara- "tion, as are other institutions that admit after three years of preparation, "but that require a minimum of four years of college work. In all cases "the total of high school and college work must not be less than seven "years in advance of grammar school studies or the institution cannot be "registered as giving a full college course."

If these requirements, which are now legal in New York, should be extended over the whole United States, it is doubtful if any of our so-called pharmaceutical colleges could be recognized as such, excepting perhaps one or two schools that form branches of State universities; and yet there is nothing in these requirements that is unfair, unjust or exorbitant. If we consider that a number of our pharmaceutical colleges do not even ask for a common school education, that we can daily meet graduates, and even doctors of pharmacy, who cannot write their own language correctly, we must not wonder that our graduates are not recognized by really professional schools, and that so many pharmacists speak disparagingly of our colleges and their graduates. It can be said, without fear of contradiction, that in no line of business or profession, are the preliminary requirements so low as in pharmacy; we accept young men who have not even passed through the grammar school, and could not think of filling the position of entry-clerk or book-keeper; we subject them to no preliminary test, and turn them out as accomplished pharmacists. They are expected to read and translate Latin prescriptions without having ever seen a Latin reader or grammar; we instruct them in chemical problems, for the understanding of which advanced branches of mathematics are absolutely needed, when they cannot even figure the dose of a complicated prescription; we tell them that the United States Pharmacopœia must be their guide, and we know that they cannot read one page of this book intelligently. To them the college is simply a means for an end; they do not study for the sake of learning, but for the sake of passing an examination, and never expect to touch a scientific book afterwards. This system has gone on for a generation, and can we wonder that pharmacy is on the down grade, and loses its character as a profession more and more?

The requirements of the Regents of New York, namely a total of high

school and college work of not less than seven years in advance of grammar school studies, is, in the opinion of the Committee, the only proper foundation on which the future fruitful development of pharmacy should be based. As, however, the practical side of our profession is fully as important as the theoretical, it seems fair that a part of this work might be supplanted by practical experience, so that two of the seven years spent in an approved pharmacy should be counted as so much study. It matters little whether this practical experience is taken before or after the real college work, as long as it becomes a requirement for final registration. As most public schools graduate their pupils at the age of thirteen or fourteen, the end of this seven years' course would find the young man at the age of about twenty-one, which is the legal minimum age for registration in most states. The seven years may be subdivided in a number of ways, and it may be left to the authorities of each locality how to do this, be they Boards of Regents, Boards of Pharmacy, the Pharmaceutical State Association, or the Legislature. The highest proficiency would be reached by four years of high school, two of practical work and three of college, making nine years together. It is not likely that this ideal standard will be reached for a number of years. The next grade, and one that should be attained, comprising eight years, would be four years of high school work, two of practical work and two of college; or three years of high school, two of practical work and three of college work, the latter being the preferable one in the committee's opinion. It is true that most pharmaceutical colleges have only a two years' course; but we all know that three years are by no means too long to exhaust the disposable material. If this eight years' course is still considered too high a standard, a seven years' course may be subdivided into three years of high school work, two of practical work and two of college; or two of high school, two of practical work and three of college. A third subdivision, namely, two of high school, three of practical work, and two of college, seems to be the least desirable, considering that nearly all college courses extend over little more than six months, so that if the student takes a position during the summer, as most of them do, a "two years' practical experience" really means a three years' experience.

In recommending any of these courses, which are still below that of medicine, but about equal to that of dentistry or veterinary medicine in the State of New York, the Committee is well aware that a sudden change from present conditions to this advanced position is impracticable and in most cases impossible. Reform in education must not be brought on by sudden bounds, and a gradual scale rising from year to year should be introduced. One objection that will certainly be raised, and the most sweeping one, will be that with such a standard many small colleges will not be able to exist. To this objection there is but one answer, namely, *that they should not exist.* It would be far better for our young men, and for pharmacy in

general, if such schools, that are colleges only by name, could be eradicated; far from forwarding the cause of pharmacy, they generally only deceive themselves, their students and the public, and their only excuse for existing seems to be the tickled ambition of men of mediocrity. The colleges, however, who earnestly desire the advancement of pharmacy, should make the development on these lines their issue, and spare no efforts to accomplish this end. Their trustees or managers should see that each occurring vacancy be filled by a man of academic education; their teachers should impress on the students and their pharmaceutical friends the necessity of higher requirements, and instead of losing they will gain prestige and reputation, and pharmacy will then be accepted as a peer among the other professions. It seems to your Committee that the teachers of our pharmaceutical colleges have the power to institute such reforms in their own hands, if they earnestly desire to do so. An example is set them in this respect by the larger universities in all parts of the United States, who for a number of years have appointed joint committees of professors and teachers of preparatory schools, for the purpose of evolving a scheme whereby a general university examining board shall be established to which is to be given the entire control of all examinations for admission, thereby making these examinations uniform for all universities. The committee on uniform entrance requirements proposes that there be a central examining board, whose certificate shall admit to any of the colleges agreeing to the regulations. This board will assign a value to each subject, and the requirement in that subject will be fixed; but there will be such a variety of subjects to select from, as the rules of the particular institution or the fancy of the student may demand This plan is being matured, and it is hoped that all the details will be decided this spring. There is no reason why a similar joint committee could not be appointed by our pharmaceutical colleges. In the entrance examinations the standard of a three years' high school should be the minimum, but by selecting a large series of subjects and assigning a value to each one, the variations in the requirements of different schools and localities could be met. An aggregate of fifteen counts should be required, assigning three counts each to English and elementary Mathematics. For the other nine counts the student may select from a long list of studies, including: Advanced English, English Composition, Rhetoric, English Literature, American Literature, German, French, Latin, Greek, Advanced Arithmetic, Algebra, Advanced Algebra, Plane Geometry, Solid Geometry, Plane Trigonometry, Spheric Trigonometry, Astronomy, Physics, Chemistry, Physical Geography, Geology, Botany, Zoölogy, Physiology and Hygiene, General History, English History, United States History, Advanced United States History, State History, Civics, Economics, Stenography, Book-Keeping, Drawing. Each study has a fixed number of counts. The term "count" represents ten weeks' work in one of these studies. Nearly all these studies will again admit of further subdivision, for instance: Latin might be divided into

Cæsar's Commentaries, Sallust's Catiline, Cicero's Orations, Virgil's Æneid, Ovid's Metamorphosis, Latin Composition, etc.; Or German in the following way: German Grammar, German Composition, Grimm's Mährchen, Lessing's Nathan der Weise, Schiller's Wilhelm Tell, Paul Heyse's Rabbiata, etc.

A list of approved high schools, whose certificates would admit without examination, would soon be established, and can easily be obtained from other examination boards; the Regents of New York have registered institutions throughout the world if they offer academic work equivalent to one or more years in a registered high school. Courses in about 6,000 high schools, embracing institutions in almost every civilized country in the world, are registered as meeting wholly or in part the statutory requirements for admission to professional schools, while courses of the 750 institutions in the University are registered on a similar basis.

With such reforms in our colleges other reforms will come as a natural sequence. No apprentice will be accepted without proper education, and no candidate admitted to examination before a Board of Pharmacy unless he is a graduate of a pharmaceutical college. This latter requirement, namely, graduation from a college as a pre-requisite for examination before a Board of Pharmacy, is now agitating the pharmacists in more than one State and gains friends every day; it has also been incorporated in the draft of the "Model Pharmacy Law" that has come for discussion before us. With these two clauses, namely, high school requisite for our colleges, and college graduation requisite for licensing, the future of pharmacy will become brighter from year to year and the illiterate will soon be extinct.

The salvation of pharmacy as a profession rests on these principles; no other method but higher education can free us from the drawbacks under which we now suffer; we older ones may be compelled to plod along as best we can, but let us give the generation that comes after us a broader foundation, and let us prepare them for a wide scientific understanding before we try to teach them the mastery of technical details.

It was the hope of such a future in pharmacy that filled the breast of one of our greatest teachers, Professor John M. Maisch, who, in his last conversation that a member of your committee was privileged to have with him, said:

"The root of all evil in pharmacy lies in the lack of preliminary educational requirements of our apprentices as well as students. Not until American pharmacy will recognize the necessity of high school education for all new comers, can we expect to be called professional men, or free ourselves from the commercial misery that now threatens to overcome us."

WILLIAM C. ALPERS,
A. B. LYON,
F. W. E. STEDEM,
Committee.

Applause followed the reading of the paper.

THE CHAIRMAN: This very excellent Report of the Committee on Preliminary Education is now before the Section. What will you do with it?

Mr. Stewart moved to receive and refer to the Committee on Publication, and it was so ordered.

MR. SHEPPARD: I wish to emphasize the fact that this idea of preliminary education and the general requirement of being a graduate in pharmacy as a preliminary to licensing as a pharmacist has made very rapid progress in the last seven years. The general acceptance of the ideas in that law—and this paper emphasizes the same ideas—is one of the most gratifying facts in the progress of pharmacy of late years.

THE CHAIRMAN: I have a paper here, prepared by a prominent member of the Association, on "The Status of the Drug Trade in Maine under the Prohibition Laws of the State." I wrote to several pharmacists to prepare papers of this character, but only one has had time to do so. The Secretary will read the paper in part.

The Secretary then presented the paper, the full text of which is as follows:

THE STATUS OF THE DRUG TRADE IN MAINE UNDER THE PROHIBITORY LAWS OF THE STATE.

BY CHAS. K. PARTRIDGE.

I have recently received request from the Chairman of your Section on Education and Legislation that I prepare a paper for the Association on "The Present Status of the Drug Trade in Maine, regarding the sale of liquor; under what limitations it is allowed to be sold; what are these limitations; are these limitations observed; if not, why not?"

It would be impossible on so short a notice to give to this matter in a concise paper the full consideration required, involving as it would the mooting of legal, political and temperance ethics as illustrated by the operation of Maine's prohibition laws on the drug trade of the State.

It can be stated without exaggeration that these laws bear very harshly upon the pharmacist. Under the "Maine Law" he is technically a criminal if he sells or dispenses alcoholic stimulants or malt liquors for medicinal or other uses, and is liable to its numerous statutory penalties of fine and imprisonment, or both. As can be readily perceived, he is often compelled in emergencies or by public, private or physicians' requirements to violate or evade the provisions of the law. To dispense liquors, even on a physician's prescription, the apothecary must, under the United States Internal Revenue laws, take out a liquor dealer's stamp or tax; this action makes him a violator of State law, as a copy from the record in the United States District Collector's office is *prima facie* evidence for indictment and conviction in the State Courts, and in most of the counties of the

State the apothecaries are legally mulcted on this evidence once or twice a year, large fines being exacted. These fines in individual cases often amount to more than the pharmacist's liquor sales. In some jurisdictions the Courts permit a degree of mercy to season their justice, by imposing the minimum fine of fifty dollars, or quietly letting his indictment drop; while in others, especially where extravagant county expenditures are to be indulged in and the general taxpayers benumbed to true conditions, the edict of the Court is "use all alike" who pay the Government liquor tax—and so the fine is made high, and druggists, beer sellers, saloons, "speak easies" and all who have paid the United States tax are raked in for county revenue. The inference that the pharmacist is led to draw from such proceedings is that he must be sure and break the laws often, and sell enough to pay his court taxes or fines. I have knowledge of one jurisdiction in the State—Cumberland county, of which the city of Portland is the center—and think there are others, where such judicial enforcement of the law on the legitimate apothecary does not obtain to any extent. In this connection it should be stated that some pharmacists do not take out the United States liquor license, preferring to risk chances that their necessary evasions of State laws may not be brought in the courts against them. It would seem the more manly way to pay the Government tax, the justice of which no one disputes, conforming to United States laws, if not to those of the State.

With this tendency toward demoralization, which has long embarrassed the drug trade of the State, through miscalled temperance laws, it is not surprising that a number of keen men, with intent to cover liquor-selling by mortars, have crept into registration, notwithstanding the efforts of our able Commissioners of Pharmacy. A proper regulation of necessary sales for medicinal use would obviate this difficulty; but still the pharmacists of Maine are to be congratulated on the high standard of character and ability they have generally maintained for themselves personally and professionally, despite these adverse conditions. It might be added too, that the people of Maine may be congratulated on their sturdy traits, which notwithstanding this chronic prohibition craze, have enabled them to preserve their self-respect and sustain their influence in the counsels of the Nation, while bending knee to this prohibition idol.

Now the question naturally comes, why cannot these laws be changed, as they certainly should be, in the opinion of the best thinkers of the State? This has been attempted several times in the last twenty years. The druggists and their friends, backed by the strongest petitions, have asked the Legislature to legalize their legitimate right to dispense alcoholic stimulants under suitable regulations, when medicinally required. Our prohibition friends, while privately admitting the justice of such claims, have, through their active organizations working in political lines, opposed favorable legislation. "Don't take down the bars which may

lead to opening the flood-gates of intemperance" was their ostensible argument in objection to any change in the law—though how the flood-gates could be further opened than to-day, after half a century's trial of prohibition, is a puzzle. The following statements illustrate some of the diverse influences which hitherto have prevented modification of these laws:

At least seventy-five per cent. of all cases on the criminal dockets brought into the courts of Maine are for direct violation of the Prohibitory Laws, showing that intemperance has not decreased, nor is liquor selling suppressed by prohibition. This fact also gives an inkling of the interest of some feed officers of the courts and of some attorneys in having these laws and legal methods remain as they are, though the legal fraternity as a whole disapproves them.

Strong influences opposed to change are illicit dealers with pulls for votes at primaries and polls, who, taking chances, can see better average gains with prohibition than without it. They can sell cheap goods in Maine at high prices, and a fine once or twice a year is low license for them.

Auxiliary to these forces, outside the State's limits and jurisdiction are manufacturers and dealers in cheapest grades of spirits for "Maine supply," who sluice their products into the State in large quantities and for good profits, though not to the profit of consumers in Maine. To them prohibition is a boon, and their influence is presumed to run through various channels of the political prohibition stream. Take the above illustrations; combine the force of their elements with that of active prohibition organizations composed of rural politicians, who argue glibly against "licensing a crime;" good women who mix up emotion and prohibition with true religion and temperate self-restraint; occasional ministers who do not interpret scriptural truths according to St. Paul, and some other people who think little, but follow their crowd: add to this combination sufficient quantity of misconception and fanaticism, with lack of social and hygienic knowledge, and the resulting incompatible mixture administered in full doses to our legislators has thus far prevented any action favorable to pharmacists' rights.

Augusta, Me., May 7, 1900.

THE CHAIRMAN: I do not know that I can endorse all that Mr. Partridge has said, but he, of course, is on the ground and knows the situation better than we do. It seems that the druggists in Maine are "between the devil and the deep blue sea." What will you do with the paper, gentlemen?

On motion of Mr. Alpers, it was referred for publication.

THE CHAIRMAN: We have three other papers here of interest, but as it is getting quite late, and the writers are not present, I think they had better be read by title only, and the Secretary will so present them.

The Secretary gave the titles of the papers referred to as "Fluid Extract Labels," by E. G. Eberle, of Texas; "Erroneous Prescriptions," by Louis Schulze, of Baltimore, and one concerning the sale of liquors by pharmacists, by G. G. C. Sims, of Washington city.

The full text of said papers was as follows:

FLUID EXTRACT LABELS.

BY E. G. EBERLE, DALLAS, TEX.

I take the liberty of styling the article as above to condone in a measure the unpardonable disparity between the directions on the labels of some manufacturing pharmacists, with that of the product to be obtained therefrom. It is not my purpose to condemn, at this time, the practice of making tinctures from fluid extracts, but to show how utterly impossible it is to make the product desired by the directions given on the label, to question in some respects the statements of the label, and to show absolute errors of relationship in corresponding formulas on the same label. If medicine is an exact science, and the patient must receive a graduated dosage for the ailment he is suffering with, if the variation of strength in these remedies is a hindrance in the practice of medicine, then it is essential that these formulas should be in accordance with the standard of strength laid down in the Pharmacopœia.

These are plain facts which even the novice in medicine or pharmacy can readily apprehend. The incongruities, positive fallacies, and last, but not least, mathematical errors on the labels of some Fluid Extracts have much annoyed me; and knowing that it is quite frequently the case that preparations are made according to the directions given upon the label, instigated me to point out in a few instances these deficiencies. For this purpose I have taken a well-known manufacturer's products, without any selection, except that I will refer only to those from which official products are directed to be made. Of the latter I did not have a full line convenient, therefore the list is not complete, but as these are not further selected, will speak fairly for the errors referred to. I do not comment on the labels of fluid extracts of drugs of which tinctures are not officially recognized, as the strength of such preparations would, to a degree at least, be arbitrary in strength; it will, however, be self-evident that the same disparity exists here, if not to a greater extent.

It would be ungenerous to call the name of the manufacturer whose products, or rather the labels of whose products, are here criticised. Suffice it that they are the products of a prominent manufacturer, and all of the same house. Had I shown the products of various manufacturers, I could have made the list complete; but it would not have served my purpose as well, namely, to show the percentage of irregularity in one line of

these preparations. It will be evident that no reliance can be placed on the dose given, if those of the dispensatory are practically correct. I hope to be understood that I am not advocating the method of making tinctures from fluid extracts; but if manufacturers do advertise them for this purpose on the labels, then they should, at least, pay careful attention that the drug is represented in proper proportion in the dilution, whether this dilution retains the active constituents in solution or not.

Name of Fluid Extract.	Directions on Label for Official Tincture.	Pharmacopœial Strength.	Dose given on Label.	Dose given in Dispensatory.	Remarks.
Aloes.....	F. E. Aloes, 1⅝ ozs., or 50 Cc. F. E. Licorice. 3⅓ ozs., or 100Cc. Dil. Alcohol, 11⅛ ozs., or 350 Cc.	Purified aloes, 100 grm. Licorice root, 200 grm. Dil. Alcohol to make 1000 Cc.	20–60 drops.	½–1 drm.	Error in comparative formulas; also F. E. is estimated in formula on label as of equal strength as purified aloes.
Aloes and Myrrh..	F. E. Aloes and Myrrh, 1 part. Alcohol 1½ parts.	Purified aloes, 100 grm. Myrrh, 100 grm. Licorice root, 100 grm. Alcohol, 750 Cc. Water, 250 Cc.	1–2 drs.	1–2 drs.	Alcoholic strength is changed by label.
Arnica Flowers ..	F. E. Arnica Flowers, 3¼ ozs. Dil. Alcohol, 12¾ ozs.	Arnica flowers, 200 grm. Dil. alcohol, to make 1000 Cc.			Nearly correct as to strength.
Asafetida	F. E. Asafetida, 1 part. Alcohol, 1½ parts.	Asafetida, 200 grm. Alcohol, to make 1000 Cc.	30–60 m.	30–60 m.	
Orange Peel.....	F. E. Orange Peel, 2 ozs. Dilute Alcohol, 14 ozs.	Orange peel, 200 grm. Alcohol, 600 Cc. Water, 400 Cc.			Considerable variation in strength, also in alcoholic strength.
Belladonna Leaves	F. E. Belladonna Leaves, 15 parts. Alcohol, 85 parts.	Belladonna leaves, 150 grm. Dil. alcohol, to make 1000 Cc.	10–20 drops.	15–30 drops.	Variation in alcoholic strength.
Benzoin.....	F. E. Benzoin, 8 ozs. Alcohol, 8 ozs.	Benzoin, 200 grm. Alcohol, to make 1000 Cc.			
Bryonia.....	F. E. Bryonia, 1⅝ ozs. Alcohol, 14⅜ ozs.	Bryonia, 100 grm. Alcohol, to make 1000 Cc.	40–60 drops.	1–2 drms.	Slight variation in strength.
Columbo	F. E. Columbo, 2 ozs. Diluted Alchol, 14 ozs.	Columbo, 100 grm. Alcohol, 600 Cc. Water, 400 Cc.	½–2 drs.	1–4 drs.	Variation both in strength and menstruum.

Name of Fluid Extract.	Directions on Labels for Official Tincture.	Pharmacopœial Strength.	Dose given on Label.	Dose given in Dispensatory.	Remarks.
Indian Hemp	F.E.Indian hemp, $3\frac{1}{4}$ ozs., or 97 Cc. Alcohol, $12\frac{3}{4}$ ozs., or 383 Cc.	Indian Cannabis, 150 grm. Alcohol, to make 1000 Cc.	10–15 drops.	30–50 m.	Incorrect corresponding formulas—Very incorrect as to strength for this active drug.
Cantharides.....	F. E. Cantharides, 1 oz. Alcohol, 19 ozs.	Cantharides, 50 grm. Alcohol, to make 1000 Cc.	1–3 drops.	3–10 drops.	
Capsicum.....	F. E. Capsicum, 1 oz. Water, 1 oz. Alcohol, 18 ozs.	Capsicum, 50 grm. Alcohol, 950 Cc. Water, 50 Cc.	10–20 drops.	½ to 1 dr.	
Cimicifuga	F. E. Cimicifuga, 3 ozs , or 100 Cc. Alcohol, 13 ozs. or 400 Cc.	Cimicifuga, 200 grm. Alcohol, to make 1000 Cc.	1–2 drs.	1–4 drs.	Variations in corresponding formula.
Cinchona.....	F. E. Cinchona, 20 parts. Glycerin, 10 parts. Alcohol, Water } each to make 100 parts.	Cinchona, 200 grm. Glycerin, 75 Cc. Alcohol, Water, } each to make 1000 Cc.	1 dr.	1–4 dr.	
	For Cinchona Co.	Cinchona Co.			
	F. E. Cinchona, 10 parts. F. E. Bitter Orange Peel, 8 parts. F. F. Virg. Snake Root, 2 parts. Glycerin, 10 parts. Dil. Alcohol, 70 parts.	Red Cinchona, 100 grm. Bitter Orange Peel, 80 grm. Serpentaria, 20 grm. Glycerin, 75 Cc. Alcohol, Water, } each q. s. to make 1000 Cc.	1 dr.	1–4 dr.	
Cinchona Comp..	F. E. Cinchona Co., 1 part. Dil. Alcohol, 4 parts.	See formula given above.	1 dr.	1–4 dr.	
Colchicum Seeds .	F. E. Colchicum seed, $2\frac{3}{8}$ ozs. Dil. Alcohol, $13\frac{5}{8}$ ozs.	Colchicum Seed, 150 grm. Alcohol and Water to make 1000 Cc.	15–30 drops.	½ to 1 drm.	Slight variation.

Name of Fluid Extract.	Directions on Label for Official Tincture.	Pharmacopœial Strength.	Dose given on Label.	Dose given in Dispensatory.	Remarks.
Cubebs	F. E. Cubebs, $1\frac{5}{8}$ ozs., 50 Cc. Alcohol, $14\frac{3}{8}$ ozs., 430 Cc.	Cubebs, 200 grm. Alcohol, to make 1000 Cc.	1–2 drm.	$\frac{1}{2}$ to 2 drms.	Variation both in formula and strength.
Digitalis	F. E. Digitalis, $2\frac{3}{8}$ ozs. Alcohol 76 per cent., $13\frac{5}{8}$ ozs.	Digitalis, 150 grm. Dil. Alcohol to make 1000 Cc.	1–3 drops.	10–20 drops.	
Guaiac Ammon...	F. Guaiac Ammon., 4 parts. Alcohol, 12 parts.	Guaiac, 200 grm. Arom. Spt. Ammonia, to make 1000 Cc.	$\frac{1}{2}$–1 drm.	1–2 drms.	Impossible to make a liquid guaiac of such strength that when diluted $\frac{1}{4}$ will equal strength U. S. P.
Golden Seal	F. E. Golden Seal, $3\frac{1}{4}$ ozs., or 97 Cc. Dil. Alcohol, $12\frac{3}{4}$ ozs., or 383 Cc.	Golden Seal, 200 grm. Dil. Alcohol to make 1000 Cc.	1 dr.	$\frac{1}{2}$ to 1 dr.	Note error in corresponding formulas.
Hyoscyamus	F. E. Henbane, $2\frac{3}{8}$ ozs. 75 Cc. 76 p. c. Alcohol, $13\frac{5}{8}$ ozs. 425 Cc.	Henbane, 150 grm. Dil. Alcohol, to make 1000 Cc.	1 dr.	1 dr.	Difference in strength of alcohol, also error in corresponding formulas.
Krameria.....	F. E. Krameria, 3 ozs. Dil. Alcohol, 13 ozs.	Krameria, 200 grm. Dil. Alcohol, to make 1000 Cc.	2–4 drms.	1–2 drms.	Varies in strength from U. S. P.
Lavender Co—...	F. E. Lavender Co—, 1 part. Dil. Alcohol, to make 20 parts.	Oil Lavender Flow., 130 m. Oil Rosemary, 2 Cc. Cassia, 20 grm. Cloves, 5 grm. Nutmeg, 10 grm. Red Saunders, 10 grm. Alcohol, Water } to make 1000 Cc.	1 dr.	1 dr.	Highly improbable that dilution could conform to U. S. P. strength.
Lobelia	F. E. Lobelia, 2 ozs. or 60 Cc. Alcohol, 7 ozs. or 420 Cc.	Lobelia, 200 grm. Dil. Alcohol, to make 1000 Cc.	40–60 drops.	$\frac{1}{2}$ to 1 teaspoonful.	Varies in every particular.

Name of Fluid Extract.	Directions on Label for Official Tincture.	Pharmacopœial Strength.	Dose given on Label.	Dose given in Dispensatory.	Remarks.
Squill	F. E. Squill, 15 parts. Dil. Alcohol, 85 parts.	Squill, 150 grm. Alcohol, 3 p. } q. s. to make Water, 1 p. } 1000 Cc.	10–30 drops.	20–40 drops.	Variation in alcoholic strength.
Valerian	F. E. Valerian, $3\frac{1}{4}$ ozs., or 100 Cc. Dil. Alcohol, $12\frac{3}{4}$ ozs., or 400 Cc. Ammon. Tr. Valerian. F. E. Valerian, $3\frac{1}{4}$ ozs., or 100 Cc. Ar.Spt.Ammon., $12\frac{3}{4}$ ozs.,or 400Cc.	Valerian, 200 grm. Alcohol, 3 p. } q. s., to make Water, 1 p. } 1000 Cc. Ammon. Tr. Valerian. Valerian, 200 grm. Ar.Spt.Ammon.,to make 1000Cc.	1 dr.	1 dr.	Variation in formulas and alcoholic strength; in latter formula also deficiency of Aromat. Spt. Ammonia.
Veratrum Viride	F. E. Veratrum. Alcohol, each 50 parts.	Veratrum Vir., 400 grm. Alcohol, q. s. to make 1000 Cc.	2–10 drops.	3–8 m.	Very incorrect for so active a preparation.
Ginger	F. E. Ginger, $3\frac{1}{4}$ ozs., or 97 Cc. Alcohol, $12\frac{3}{4}$ ozs., or 380 Cc.	Ginger, 200 grm. Alcohol, to make 1000 Cc.	1 dr.	1 dr.	Variation in formulas.
Kino	F. E. Kino, $1\frac{1}{2}$ ozs. Dil. Alcohol, $14\frac{1}{2}$ ozs.	Kino, 100 grm. Glycerin, 150 Cc. Water, 200 Cc. Alcohol, to make 1000 Cc.	10–30 drops.	1–2 dr.	Variatian in strength and menstruum.
Myrrh	F. E. Myrrh, $3\frac{1}{4}$ ozs. Alcohol, $12\frac{3}{4}$ ozs.	Myrrh, 200 grm. Alcohol, to make 1000 Cc.	2–10 drops.	15–30 m.	Liquid myrrh could not be made of such strength that dilution would be of U. S. P. strength.
Nux Vomica...	F.E.Nux Vomica, $3\frac{1}{4}$ ozs, or 97 Cc. Alcohol 76 p.c., $12\frac{3}{4}$ ozs.,or 383Cc.	Ext. Nux. Vom., 20 grm. Alcohol } to make 1000 Cc. Water }			Note the variation in formulas of this active product.
Opium.	F. E. Opium, 4 ozs. Dil. Alcohol, 12 ozs.	Po. Opium, 100 grm. Alcohol } q. s. to make 1000 Cc. Water }	11 m.	11 m.	

Name of Fluid Extract.	Directions on Label for Official Tincture.	Pharmacopœial Strength.	Dose given on Label.	Dose given in Dispensatory.	Remarks.
	Composition.				
Opium, Camphorated	Po. Opium. Benzoic Acid. Camphor. Oil Anise, each ½ oz. Glycerin, 5 fl. ozs. Dil. Alcohol, to make 16 ozs. Formula. F. E. Opium Camph., 2 ozs. Dil. Alcohol, 14 ozs.	Po. Opium. Benzoic Acid. Camphor, each 4 grm. Oil Anise, 4 Cc. Glycerin, 40 Cc. Dil. Alcohol, to make 1000 Cc.	1–4 drms.	1–4 drms.	
Soap Bark	F. E. Quillaja, 4 ozs. Alcohol, 12 ozs.	Quillaja, 200 grm. Alcohol, 350 Cc. Water, to make 1000 Cc.			Variation in alcoholic strength.
	Tincture.	Tincture.			
Rhubarb	F. E. Rhubarb, 2 ozs., or 60 Cc. F. E. Cardamom, 2½ dr. or 10 Cc. Dil. Alcohol, 13¾ ozs., or 430 Cc.	Rhubarb, 100 grm. Cardamom, 20 grm. Glycerin, 100 Cc. Alcohol, } each q. s. to make Water, } 1000 Cc.			Notice variation in strength and components; also, error in formula for syrup in directing minims for Carb. Potass. showing that due care is not exercised in proof reading.
	Syrup.	Syrup.			
	F. E. Rhubarb, 1½ ozs., or 45 Cc. F. E. Cassia, 2¼ drs. 0.9. Carb. Pot., 48 minims, or 0.3. Simple Syrup, to make 16 ozs., or 500 Cc.	F. E. Rhubarb, 120 Cc. Spirit Cinnamon, 4 Cc. Pot. Carb, 10 grm. Glycerin, 50 Cc. Water, 50 Cc. Syrup, to make 1000 Cc.			

ERRONEOUS PRESCRIPTIONS.

BY LOUIS SCHULZE.

"To err is human," is a trite but nevertheless truthful adage, and when referred to the writing of prescriptions by physicians, they being human, the only thing remarkable about it is, not the many but the few errors made by that profession under the perplexing circumstances in which they are so frequently placed whilst writing them.

Our object, however, is not to discuss how to prevent errors being made by the medical fraternity, but how they can best be rectified by the pharmacist when made and brought to him for compounding, hence we state our method of procedure in a few cases brought to our attention:

I. R. Tinct. Belladon. Rad. ..... ℥ iv.
Sig. 2 drops as directed.

There being no official tincture of belladonna root, the question that arose was whether the prescriber was in error as to what part of the plant was used in preparing this tincture, or, as was suggested by our clerk, whether perhaps tincture of aconite root might not be intended, hence in this case we thought best to consult the prescriber and discovered that official tincture of belladonna was wanted.

II. R. Morphin. Sulph. ..... ℥ ii
Lactis Magnesii ..... ℨ vi.
Misce et sig. Tablespoonful every hour until relieved.

This prescription was readily corrected by us, as being familiar with the physician's style of prescribing, we knew at once that two fluidrachms of Magendie's Solution was wanted instead of two drams of morphine sulphate.

III. R. Gran. Strychnin. Sulph. ana ..... gr. $\frac{1}{3}$
Dispense No. xxx.
Sig. One 3 times a day.

Being unable to communicate with the prescriber, $\frac{1}{30}$ grain granules were dispensed, which a few days later we learned to have been the author's intention.

IV. R. Tinct. Ferri Chlor. ..... grs. xl.
Sodii Chloratis ..... ℥ iii.
Glycerini ..... ℨ i.
Syr. Simplic. ..... ℨ i.
Aquæ Cinnamomi ..... q. s. ad ℨ iii.
Misce et Sig. Teaspoonful every hour.

This is merely a matter of transposition, as can readily be seen; the intention of the physician was to have written for three fluidrachms of tincture of chloride of iron and sodium chlorate forty grains.

V. R.—Natrii Brom..... ℥iiis.
Spt. Ammonii..... ℥iv.
Tinct. Opii. Deod..... ℥iii.
Syr. Limonis, q. s..... ℥iii.
Misc. Sig. Teaspoonful every 2 hours in water.

Feeling a doubt as to whether the physician really wanted plain Spirit of Ammonia, he was consulted, when it developed that he intended to prescribe Aromatic Spt. of Ammonia.

VI. R. Pulv. Opii..... ℥i.
Ext. Belladon..... ℥i.
Cerat. Plumbi Subacet..... ℥ii.
Ung't Petrolati, q. s..... ℥iv.
M. ft. Ung't. Sig. Apply locally.

The ambiguity of this prescription could only be removed by consulting its author, who explained that half an ounce of ointment was wanted, and advised the entire omission of the petrolatum.

VII. R. Strychnin. Sulph.
Elix. Ferri, Quin. et Strychnin. Phos..... ℥iv.
Sig. Teaspoonful every 3 hours.

In this case it was discovered that Elixir. of Iron, Quinine and Strychnine Phosphate was intended, and no doubt the first line was inadvertently written.

In conclusion, we would say that these were culled from 3500 prescriptions, making only a small percentage.

Unless the intention of the prescriber is very evident, it has always been our custom to interview him; and in only one instance within our recollection of twenty years' experience, was there any but the most courteous treatment received.

ANSWER TO QUERY 9: UNDER WHAT RESTRICTIONS SHOULD PHARMACISTS BE PERMITTED TO SELL LIQUORS?

BY G. G. C. SIMMS, WASHINGTON, D. C.

The following brief reply would seem to answer the question sufficiently, although the conditions may not be applicable in all the States.

Pharmacists should be permitted to sell liquors under the same restrictions governing the sale of ordinary poisons.

Liquors should be sold by the pharmacist for medicinal purposes only, and to a limited extent, say in not larger quantity than one pint.

They should be sold to only sober and respectable persons.

The sale should not be repeated to the same person on the same day, unless the quantity sold is less than one pint. The sales should be recorded in a book kept for that purpose.

The pharmacist should be held responsible for the abuse of the privilege of selling liquors. They should not be sold to minors.

THE CHAIRMAN: The next order of business is the installation of officers, but I hardly see how that can be done in this case, as the present officers—Chairman and Secretary—succeed themselves. I had hoped that these duties would devolve upon new persons, but since you have conferred this honor upon us again we shall try to do our best. We will have a longer time before the next meeting, and I hope we shall be able to make it profitable. I shall certainly do everything in my power to make the work of value to the American Pharmaceutical Association. [Applause.]

THE SECRETARY: Last year at Put-in-Bay there was quite a discussion when a young man was named for my place, but I hope that I have conducted my duties as Secretary of your Section in a proper and satisfactory manner, and I think this is evidenced in the honor you have done me in a re-election. I desire to thank you, and to say that I hope the experience I have had with the various State Boards will enable me to still better perform my duties for the next year. [Applause.]

THE CHAIRMAN: Is there any new business? If not, the reading of the minutes is in order.

Mr. Alpers moved to dispense with the reading of the minutes, and it was so ordered.

On motion of Mr. Stewart, the Section then adjourned.

After adjournment the Chairman notified the General Secretary that Messrs. Beal, Weidemann and Hay had been selected by himself and the Secretary as associate members of the Committee on Pharmaceutical Education and Legislation.

ENTERTAINMENTS AT THE FORTY-EIGHTH ANNUAL MEETING.

For the second time in the history of the Association it met in the historic city of Richmond, Va., to show its appreciation of the kind invitations extended by the Virginia Pharmaceutical Association during the past three years. Unfortunately, the early time set for the meeting, made necessary by the Pharmacopœial Convention held at Washington, D. C., prevented as large an attendance of members as is customary. Those who did attend the meeting, however, greatly enjoyed the warm hospitality extended by the Virginia pharmacists and their ladies. A more delightful place than the Jefferson Hotel for holding the meetings could not have been selected, and did much toward securing prompt and liberal attendance at the various sessions.

On Monday evening, May 7th, a reception was tendered the visitors in the spacious hotel parlors, which was attended by the Governor of the State, and a number of prominent citizens and their ladies. Refreshments were served, and the evening entertainment concluded with a dance much enjoyed by the younger people.

The carriage drive on Tuesday gave all an opportunity of seeing some of the noteworthy buildings of Richmond, among which must be mentioned the old historic State Capitol, the new City Hall, the Confederate Museum, which during the Civil War was the official residence of Jefferson Davis, the residence of Gen. Lee's family, the Marshall dwelling, the Monumental Church, the old St. John's Church, in which Patrick Henry delivered his famous speech, and others.

Among the monuments worthy of special mention are those erected to the memory of Washington, Lee and Jackson, the latter presented by an English admirer of the intrepid "Stonewall." The drive having been extended into Hollywood Cemetery, revealed the last resting-places of Presidents Madison, Monroe and Tyler, Commodore Maury, Generals Stuart and Pegram, Jefferson Davis and others, besides the gigantic rustic monument erected to the memory of the Confederate dead by the ladies of Virginia. The arrangements of the drive were excellent, each carriage being permitted to take an independent route, as its occupants might desire.

At night a performance was given in the concert hall of the hotel, under the direction of Mr. Polk Miller, at which many of the northern members had an opportunity of witnessing for the first time a genuine southern darkey cake-walk performed by local semi-professionals.

On Wednesday, about noon, a large party visited the extensive tobacco works of R. H. Patterson & Bro. to witness the manufacture of smoking and chewing tobacco on a large scale. This visit was most interesting, as it gave an opportunity of seeing one of the leading industries of the city in all its details, from the stripping of the leaf to the packing of the manufactured products. Governor Tyler having generously extended an invitation to the visitors to attend a reception at the gubernatorial mansion in the evening, a large number of ladies and gentlemen responded and were most pleasantly entertained by the Governor and Mrs. Tyler, and Col. Carrington and others of the Governor's staff.

Thursday having been set aside for a trip to Old Point Comfort, some of the early risers took a train for Williamsburg, where an opportunity was afforded of inspecting the numerous relics of Colonial Government to be found there, and later joined the special train carrying the remainder of the party, which had left Richmond shortly before 9 o'clock. Upon reaching Newport News a visit was paid to the mammoth shipyards, where a number of vessels were in course of construction, among which the battleships Kentucky and Illinois received special attention. Fortress Monroe was also visited by some of the party, and after a substantial dinner at the fine Hotel Chamberlain the return trip was made, the train being unfortunately delayed on the road for some time by a freight wreck. Mr. Polk Miller gave another very unique entertainment on Thursday evening, consisting of ante-war stories related by himself, and aided by numerous songs and dances given by a band of negro laborers from a tobacco factory. What Polk Miller does not know about the true Southern negro is not worth knowing, was the verdict of all who were present that evening.

A trolley ride through the principal streets of Richmond on Friday afternoon gave an opportunity of visiting certain parts of the city not passed on the carriage drive of Tuesday. At night Prof. Wm. Simon, of Baltimore, entertained a large audience by an interesting lecture on "Wireless Telegraphy," in which he demonstrated by experiments the various methods now followed for transmitting and receiving messages by simply flashing the electric waves through air. To many these experiments were a complete revelation, and every one seemed greatly pleased with what was said and done.

During the whole week it was evident that the Association had visited a city where the motto is "warm-hearted hospitality to all strangers." The members returning to their homes have carried with them enlarged ideas of Southern generosity, and will ever gratefully remember the Local Secretary and his efficient and courteous Committee of Arrangements. Special thanks are due to Messrs. W. H. Scott, John B. Purcell, R. H. M. Harrison, T. Roberts Baker, Edgar D. Taylor, R. Lee Powers, Alex. G. Briggs, Polk Miller, and the ladies' committee, headed by Mrs. Jeffress.

C. C., Jr.

REPORT

ON THE

PROGRESS OF PHARMACY.

From July 1, 1899, to June 30, 1900.

By C. Lewis Diehl.

INTRODUCTORY.

It is co-incident to the meeting of our Association this year in the capital city of the "Old Dominion," that twenty-seven years ago, in the same city, the office of Reporter on the Progress of Pharmacy was created, an office to which the present incumbent had the honor to be elected, and which, with a short interruption on account of ill-health, he has held continuously since. So many changes have since taken place, so many of our members then active participants in directing the affairs of the Association have passed away, or have relinquished their personal interest and counsel in its deliberations, and so many more have taken the places so honorably filled by them, that a brief review of the conditions which brought about the creation of the office of Reporter may not be regarded inopportune at this time, the more particularly since with this year we round up another century in the world's history.

As is the case in most successful undertakings, the Report on the Progress of Pharmacy had a very modest beginning. From its very inception the Association was fortunate in having among its members earnest men who, thoroughly equipped and competent in their chosen profession of pharmacy, recognized in its existence a powerful lever for elevating the standard of our profession, and they lost sight of no expedient whereby its annual publications might become so valuable as to make membership in the Association desirable to the pharmacists of our country. Among these earnest workers, the late Professor Wm. Procter, Jr., easily stands as the most prominent, and it was he who, in addition to the many preceding reports and papers, also made the first Report on the Progress of Pharmacy, as Chairman of the Committee elected for that purpose, in 1857. Largely

an experiment, this report, as intimated, was a very modest paper compared with the more elaborate reports of subsequent years. But from year to year, stimulated by the favorable reception and recognition of the practical utility of these reports, the Chairmen of the Committee on the Progress of Pharmacy vied with each other in the endeavor to increase its scope, until, towards the seventies, it became apparent that the time involved in their preparation was greater than could be in equity asked without compensation. So, when in 1872 the Committee elected in 1871 failed to present a report, the Association concluded that the time had arrived for delegating this work to some one person under reasonable compensation, and a committee was appointed to report a plan in time for the meeting in 1873, a Committee on the Progress of Pharmacy being, however, elected as during previous years. Unfortunately, the Chairman of this Committee, not being present at this meeting, had not been consulted, and, owing to a serious eye affection, was compelled to decline to serve. In this dilemma the present Reporter, having the experience of preparing reports in 1867 and 1868, was asked to undertake the work, and in this way it came about that his name suggested itself to the Association as one to be honored by an election as its first Reporter on the Progress of Pharmacy. Twenty-seven years! It is a long time, and the Reporter may be pardoned if, on the threshold of a new century, he sometimes wonders how much longer he may prove useful in the same capacity, if, indeed, the Association should see fit to retain his services for this office.

The period covered by this report has been a fruitful one in observations and investigations concerning the profession of pharmacy and its collateral sciences. These are of the most varied nature and character, and will be found very fully represented by the abstracts embodied in the pages following this introductory. As might be expected, the near approach of the eighth decennial revision of the Pharmacopœia of the United States has given incentive to numerous investigations, discussions and criticisms, with the object of improving its processes, of avoiding its objectionable features, and of introducing more acceptable ones that would seem to be calculated to make this important work an authority in fact as well as in name. Some of these criticisms and discussions are here given in brevity, and as nearly as possible in the author's own words, though in many cases it has become necessary to condense and change the original text when this could be done without destroying or obscuring the author's meaning.

A brief review of the principal points in controversy makes it evident that some decided action must be taken to make the Pharmacopœia a more acceptable work of reference. Physicians advocate for this purpose the introduction of information, hitherto withheld, concerning dosage, new

remedial agents, and in some cases, even physiological indications of remedies. They also favor, on general principles, a standardization of galenicals, though with few exceptions they do not express themselves emphatically on this subject. In brief, they favor a Pharmacopœia which shall give them essentially the information which they now obtain from dispensatories and works on therapeutics, shorn as much as possible of matter with which they are not interested. But what is most noteworthy, in their discussions one looks in vain for an expression that is indicative of a sense of responsibility in accepting or rejecting the *authority* of the Pharmacopœia. It appears to be their conviction that the Pharmacopœia is a work which concerns them only in so far as they, as individuals, find it useful; they appear to consider it unnecessary to inform themselves of the utility of its preparations, relying rather upon statements from ex-official sources, than upon their own investigation. In other words, they fail to do what every good lawyer will do—they fail to provide themselves with, and to consult, the book that defines the law, which in the case of medicinal compounds is—or should be—the Pharmacopœia.

There are doubtless many pharmacists to whom the Pharmacopœia is as little a law as it is to the average physician. As a class, however, they recognize its authority, and are disposed to abide by its requirements. They also recognize a necessity for popularizing this work, although the methods suggested by them are somewhat different. They agree that the introduction of doses will do much to make the book more popular, and they also think, with few exceptions, that the judicious introduction of synthetic remedies—not the wholesale introduction advocated by some physicians—will have a tendency to popularize it. On the standardization of galenicals they are practically a unit, differences existing only in degree and in the extent to which standardization should be carried. One class, largely composed of teachers and manufacturers, emphatically demands that all preparations for which reliable processes of assay can be devised—whether such process be one of easy execution or one beyond the scope of the average educated pharmacist—shall be standardized in the forthcoming Pharmacopœia; the other class, composed almost exclusively of the older and experienced pharmacists, insist that the standardization shall be applied only to the preparations of the more active drugs, and then only when their active constituents can be assayed with absolute certainty by processes which can be carried out under the conditions prevailing in well-equipped pharmacies.

Although only indirectly connected with the subject under discussion, the following abstract from an admirable paper by Prof. *James A. Good*, Ph. G., entitled

"Dispensing Then and Now," will doubtless prove interesting. He says, "When the nineteenth century was new, what did the apothecary

dispense? He made it himself, whatever it was. The pharmacist of the present knows only by tradition the amount of work performed by his predecessors of over fifty years ago, as the older ones who might form a connecting link between these periods have nearly all joined the silent majority. Many old-time products and processes are therefore unfamiliar to the student, or even the middle-aged apothecary of to-day. The laboratory work of the dispenser has, during the last fifty years especially, been a gradually diminishing quantity. As a factor in the education of the young man the absence of laboratory work is to be regretted, and only in part remedied by the requirement for laboratory work by the colleges of pharmacy. Because of the conditions which prevailed, dispensing in the old time was intimately associated with galenical pharmacy, and not only in the direction of the regular shop preparations and in prescription-work as recognized to-day, but, as the physician's assistant, he was required to prepare poultices, starch water, alum whey, enemas, barley water, fomentations, etc., and all this with very crude apparatus. It is therefore all the more remarkable that among the names of the noted chemists of the past many were but humble apothecaries to their neighbors. Probably those who come after us will be amused at our assumption of superior knowledge, just as we may smile on reading Dr. Andrew Duncan's preface to the "Edinburgh New Dispensatory," published in 1803, in which he points out that the "elements of pharmaceutical chemistry are illustrated and explained in the language and according to the principles of modern chemistry." While many of the processes and products in common use by our forefathers have now become obsolete, many others have survived the criticisms from period to period, and remain to-day as popular remedial agents. Nevertheless, with the introduction of alkaloids, and the growing use of these and of synthetic remedies, the labor of the man behind the dispensing counter and the remuneration which is expected to follow, have been much reduced; but chemistry has scored great triumphs, an accomplishment of the science in which all broad-minded men must rejoice. With the changes involved by the increased use of these came those of forms of administration—from boluses and self-made pills to sugar-coated pills; the introduction of elixirs (cordials) in place of the more nauseous and unpalatable remedies; the introduction of cachets, of tablet triturates, of compressed pills, and of gelatin capsules. The changes which have occurred in dispensing and manufacturing pharmacy during the century have been gradual. Up to the time of the present generation the crude organic drugs of the materia medica lists multiplied greatly, but recently, for various reasons outlined by Professor Good, their use has declined, although it is not likely that they will remain permanently in disfavor. There are pessimists who contend that the demand for persons skilled and expert in the art of dispensing is likely, ultimately, to cease. This is an

uncomfortable state of mind. Changes have occurred, but they do not justify this conclusion. The competent pharmacist will find it necessary probably to be in the future, more than in the past, a man of affairs. The essentials, however, he will not neglect. Because the business during the century has grown more complex, and the medicinal agents many times multiplied, therefore the responsibility upon him has grown greater. He is needed in the community. The public, lay and professional, will discover him.

Another interesting paper that may find place here in abstract is that portion of an address delivered by Prof. *D. J. Leech*, M. D., at the opening of the 58th session of the School of Pharmacy of the Pharmaceutical Society of Great Britain, and published under the title "Evolution of Pharmacy," in which, after an entertaining and scholarly sketch of the development of pharmacy from its beginning in the dim past, he makes some significant observations concerning

"The Present State and Future of Pharmacy." He says that it must be noticed that in recent years, with the publication of each Pharmacopœia, there has been a further call for scientific knowledge on the part of the pharmacist. It is assumed that those who use the Pharmacopœia have had a real and practical training in science, and that the tests in the Pharmacopœia have not reached the high-water mark of perfection—meaning by the latter that, as time goes on, some of the cruder tests will be replaced by others requiring more chemical knowledge and more expertness for their performance; histological examinations will be increasingly relied on in the detection of the sophistication of vegetable drugs, and hence a wider and deeper knowledge of physics, chemistry, and botany will be called for. In the introduction of standardization, which will doubtless be extended, he sees a deeper significance than the mere establishment of uniformity in the strength of galenical preparations, for he is inclined to look upon it as a sign of coming changes, which will markedly affect the future of pharmacy. For, while there are doubtless many who still believe that the active principles which can be separated from vegetable substances do not represent the entire curative power of drugs, the fact remains that more and more reliance is being placed upon the active principle of the drug than upon the drug itself, and there has consequently been a greater tendency to think of preparations of such drugs as belladonna and nux vomica in terms of atropine and strychnine, whilst even in a drug like opium, which contains other active alkaloids, it is generally recognized that the value as a sedative is determined by the morphine. Between standardization and the use of active principles there is only a short step, and though for many a day the galenical preparations prepared from drugs will still be used, they will, to a large extent, be gradually edged out by the active principles—a process which is well under way, to which the numerous tablets, granules and pilules in use,

containing definite fractions of active principles, bear ample witness. Another feature of the pharmacy of the present day is the great increase in the number of chemical preparations, the synthetics, built up chiefly by the chemists of Germany, and supplied with the necessary recommendations to physicians in England and elsewhere, who, for the most part, administer them by faith. Unless the present system of medical education is altered, and a real knowledge of chemistry and pharmacology made compulsory, the time must shortly come when the functions of the pharmacist will be greatly widened, arising from the necessity of explaining to medical men who use these compounds the chemical reasons for their introduction and value, the changes which they undergo, and the dangers that may arise from these changes within the body. This means not only an advanced knowledge of chemistry, but also some idea of physiological action as a prerequisite of the future pharmacist's accomplishments. Then also, the pharmacist, in view of the expected usefulness of extracts of the animal organs, will in the future have to enter on the wide and intricate field of animal chemistry.

Quoting rather at random, the following are the salient points concerning the evolution that will determine the functions of the pharmacist of the future. We may note already a loss of some of the older functions of the pharmacist. The collecting of herbs has passed into special hands; so too has the dealing with drugs in bulk. The production of many medicinal substances, formerly undertaken by pharmacists, is now for the most part accomplished by manufacturing chemists, who use special processes adapted to work on a large scale. Furthermore, the sale of articles unconnected with pharmacy, formerly a source of revenue to pharmacists, is likely to pass into the hands of the huge firms which have in recent times become dealers in every thing. But in other directions the work of the pharmacist will develop. It is believed that not only will the whole of the duties connected with the compounding of medicine devolve before long on the pharmacists, but other functions will be taken up by them which pertain to science training, though they may not be strictly pharmaceutical. Thus, the chemical investigations which are becoming more and more essential to medical practice might well fall into the hands of the pharmacists, who will in all places be the men of science, the men who *know*. They will be looked up to as such, and it will come to pass that much other work, more or less allied to pharmacy and chemistry, requiring scientific knowledge, will fall into their hands, and they will be remunerated for the loss of some of the emoluments arising from the purely commercial side of their present work.

Coming now more directly to the subjects dealing with the revision of the Pharmacopœia, the difficulties that may present themselves to the Committee of Revision are well voiced in an editorial by Prof. *Henry*

Kraemer, Ph. G. (Amer. Journ. Pharm., May, 1900). He says that it is doubtful if there ever was a time when there was so much interest displayed by so many different parties as is displayed in the forthcoming Convention for the Revision of the Pharmacopœia of the United States. The interests involved are not only those of physician and apothecary, manufacturing chemist and retail pharmacist, but the consumer and Commissioner of Foods and Drugs, as well. There never was a time when there were so many points of view—scientific, medicinal and commercial—from which to consider the Pharmacopœia, and so many criticisms and suggestions put forth. The occasion is a peculiar and momentous one, but under the able leadership of the present Chairman of the Committee of Revision, who will doubtless be re-elected, we may confidently look for changes to be made that are in accord with the advances of the sciences and the commerce of the past ten years, and that will be of a character fitting the first session of the twentieth century. A very interesting paper is that of Dr. *Eli H. Long*, entitled

The Scope of the United States Pharmacopœia, and presented to the Section on Materia Medica, Pharmacy and Therapeutics at the fiftieth annual meeting of the American Medical Association, in which he preliminarily revises the history of the U. S. P., and gives due credit to the increasing excellence of successive past revisions of that standard. Dr. Long, however, deplores the lack of interest that is manifested progressively by physicians in this work; for, while credit is due to both the professions of medicine and of pharmacy in the preparation of the more recent issue, that of pharmacists has been most prominent and valuable. The great interest taken by pharmacists in the work of revision was particularly shown in the composition of the convention of 1890, when, of a total of 190 delegates, only 85 represented medical colleges and societies, while 105 represented pharmacal colleges and societies. Without undervaluing the importance of pharmacal aid, but recalling the fact that the Pharmacopœia was originated in response to a need on their part, Dr. Long asks his professional brethren whether they are not shirking their duty in respect to its perpetuation when they allow pharmacal influence to predominate in the convention which directs its issue. For the sake of medical science as a whole, and of sound therapeutics in particular, physicians cannot afford to neglect this important work, and it should be urged on every medical society and college entitled to representation in the coming convention, to choose delegates and secure their attendance, so that a large number of practicing physicians and teachers may take part in its deliberations.

The importance of a prominent voice by physicians in these deliberations is emphasized by the fact that there is some difference of opinion as to what should be the scope of the Pharmacopœia. A most conservative view—one which is based on a full recognition of its position as a standard

—would strictly exclude every article that has not stood the test of time and of ethics, or of which positive physical or chemical qualities can not be taken as determining purity and strength. On the other hand, an ultra liberal view would admit many new substances, for the purpose of putting them on trial so as to test their value. Between the two there are all grades of opinion; and, while the former view has prevailed in the past, during the present decade there has been much discussion of the question of introducing new features in the next revision. It was with the purpose of deciding between these diverging views, as well as to determine what is needed in this work to overcome the manifest indifference of the medical profession to it, that a committee of the Medical Society of the State of New York, two years ago, began its efforts in the direction of increasing medical interest in the Pharmacopœia, and some of the results of the work of this committee are now presented by Dr. Long, which are here briefly outlined as follows:

A series of four questions and, subsequently, a series of six propositions, were submitted to the teachers of materia medica and therapeutics in the medical colleges. Sixty responses were received to the questions, which revealed the deplorable lack of familiarity with the Pharmacopœia by the fact that even some of the teachers of materia medica confound that work with the U. S. Dispensatory. Excluding these, the answers to Question 1, "Do you find the 'U. S. Pharmacopœia' meeting the demands as a standard for drugs and preparations," were: Yes, 34; yes, qualified, 7; no, 9. To Question 2, "Is it abreast of the present advances in medical and pharmacal science?" the answers were: Yes, 29; yes, qualified, 9; no, 11; no, qualified, 4. To Question 3, "What in your opinion stands in the way of its more general use by practicing physicians?" and Question 4, "What can you suggest in a general way in the line of improvements in the 'U. S. Pharmacopœia?'" the answers were too varied to admit of any concise tabulation. They relate to the character of the book, impracticabilities, incompleteness, obsolete drugs, the attitude of physicians, charges of ignorance and indifference, under Question 3; and to abridging the contents of the book, the introduction of doses, information on new substances, and more frequent editions or issues of supplements, under Question 4. One hundred responses were received to the propositions subsequently submitted to the same class of medical men, all of them being endorsed by good majorities, ranging from 63 in a single instance, to from 80 to 91 in all the others. These propositions were the following: 1. That all drugs and preparations not now prescribed to any extent be dismissed. 2. That all chemical drugs necessary to other preparations, but which are not directly prescribed, be placed in a list apart from the body of the work. 3. That doses be included in the next revision. 4. That the doses be placed in the index rather than in the text of the book, for readier reference and to avoid making them official. 5.

That a section be devoted to giving reliable information concerning new remedies, without in any sense making them official. 6. That an annual supplement of a few pages, giving disinterested information concerning new drugs, be issued.

In a letter to the "Journal of the American Medical Association," Dr. *Robert Edes* discusses the same subject. Referring to the question of Dr. Long, whether physicians are not shirking their duty when they allow pharmacal influence to predominate in the convention which directs the issue of the Pharmacopœia, he answers that if medical colleges and societies send 85 out of 190 delegates, as they did to the convention of 1890, medical interests are fully represented. The details of the Pharmacopœia are properly in the hands of pharmacists. The amount of information which the up-to-date practitioner of medicine is absolutely obliged to acquire has so enormously increased that he must cut off all that does not necessarily come within his province. On the other hand, the processes and scope of pharmacy have been so specialized that the practitioner can have this part of his work done so much better than he can do it, even if he had the time, that the separation has taken place with great mutual advantage. But it is desirable, in the interest of the medical profession, that its members should become acquainted with the official and authoritative statement of their pharmacologic instruments, and that they should be able to look to some disinterested source for information on the enormous number of new remedies—good, bad and indifferent, honest and fraudulent—which are constantly thrust before them in advertisements and specimens, and in regard to which it is almost impossible that they should independently inform themselves. There are two reasons why the Pharmacopœia is comparatively unknown to the physician. The first is that it contains so much that he does not want and cannot use; the second, that it does not contain the information for which he most frequently consults a book of reference, *i. e.*, doses and new remedies, or sometimes the best form of administration. This information is supplied by the two Dispensatories, and by the numerous and excellent works on therapeutics, which usually contain enough of pharmaceutic detail for ordinary use by the practitioner; and it is with such works as these that the next Pharmacopœia must in some way compete if it is to have any extensive sale among physicians. Would it not be possible to publish under the auspices of the convention two editions, to be called respectively the physicians' and the pharmacists' edition, using the same arrangement and the same text so far as appropriate to each, but having in the physicians' an appendix containing, in an abridgement, all that is positively known of unofficial drugs? In the pharmacists' edition it might be unnecessary to put many articles which are not subject to exact chemical and pharmaceutic tests of purity, though, under existing conditions, it might be well to include them also. Such editions would be really an abridged dispensatory, and occupying

the position of the Pharmacopœia, and possessing the qualities of disinterestedness, impartiality and freedom from individual prejudice, would be of the highest value to both professions.

One of the clearest and most comprehensive papers on the subject of the forthcoming revision is that of the Chairman of the Committee of Revision, Dr. *Charles Rice*, communicated to the American Journal of Pharmacy (Dec., 1889), in which he discusses "*Some Pharmacopœial Problems.*" Originally intended to be the official guide both for the physician and the pharmacist, during the earlier period of its existence the physician took greater interest in the Pharmacopœia, and had a larger share in its preparation or revision than the pharmacist. But, although largely responsible for the present character of this work, the Pharmacopœia has ceased to be a work of reference for the physician, chiefly because it does not contain the information which he requires regarding the nature, properties and doses of the most important remedies he uses. It is true, he may usually find satisfactory information in the Pharmacopœia concerning the form or forms of administration that are officially available in the case of a certain drug, and what is the strength of the important preparations; but he utterly fails to find any information corcerning the ordinary doses, and this being probably the most important inquiry to him, he turns at once to sources which he has found by experience to give him all this information. Similarly, the pharmacist has frequent occasion to look for precisely the same information that the physician wants, and, knowing that he would look for it in vain in the Pharmacopœia, he at once consults some other works of reference, preferably one which will give him at the same time all other needed information regarding physical or chemical properties, solubilities, incompatibilities, etc. Under these conditions it is not surprising that the Pharmacopœia should not be a popular book either among physicians or pharmacists.

Concerning the so-called "Newer Remedies," and more particularly the "patented" synthetics, Dr. Rice remarks that a curious anomaly may be observed in the position taken with reference to them by many physicians, who in their daily practice freely prescribe, such as trional, sulfonal, phenacetin and others, advocate their use in their medical writings and even on the lecturer's platform, yet are disinclined to vote for their admission into the Pharmacopœia. If the Pharmacopœia is to be gradually purged of old and useless drugs and preparations, and not to be brought up to date by the introduction of the newer drugs of recognized value, used universally by the medical profession, it might just as well remain unrevised; indeed, the time might eventually arrive when the Pharmacopœia would cease to be of service even as a text-book in the medical and pharmaceutical schools of our country.

Formerly the Pharmacopœia was a work chiefly concerning itself with what its name expresses, namely, the *making* of medicines. At the present day the name has already become, at least partially, a misnomer, and the time may not be far distant when it should be called Pharmaconomia or Pharmacographia, that is, a book *prescriptive* or *descriptive* of medicines. Under the exacting demands which are made at the present day, under various laws, upon the quality of medicines dispensed by pharmacists, the latter have become more and more unwilling to assume full responsibility for the quality, and particularly the exact strength, of the preparations they dispense, and they prefer to shift this responsibility upon the manufacturer, who is willing to assume the responsibility himself, and into whose hands, for this and other reasons mentioned by Dr. Rice, the manufacture of certain classes of pharmaceutical preparations is being definitely relegated. Thus, with the elimination from modern pharmacopœias of working processes for preparations which are known to have passed almost entirely into the large manufacturer's hands, and the substitution of more detailed descriptions and tests, the function of the pharmacist is chiefly confined to an examination of the preparations which he buys, by means of such tests as are available to him. Among these tests, those which are intended to show the strength of the preparations by gravimetric or volumetric assays have been made more and more rigorous, and their application has been extended to drugs and preparations which formerly were not subject to strict regulations. The demand for the standardization of the preparations of potent drugs has resulted in such requirement, in the revision of 1890, in the cases of two drugs, namely, cinchona and opium; but with the very material advance made in methods of proximate analysis, there is every reason to hope that processes of assay can be provided at the forthcoming revision for many others.

Summing up, Dr. Rice offers substantially the following recommendations:

1. That the next Committee of Revision be authorized to introduce doses into the Pharmacopœia.

2. That the Committee be authorized to introduce such of the newer remedies as fulfil the following conditions: (*a*) If the remedy is a definite chemical compound, its chemical composition and physical and chemical properties shall be known and controllable. (*b*) It should have passed the experimental period, and should be in regular and general use by the medical profession as a remedy of a definite and recognized therapeutic value.

3. That the Committee be instructed to extend the principle of standardization to as many of the potent drugs, and preparations made from them, as may be found possible, but that no physiological tests be introduced at the next revision.

With reference to the latter proviso, Dr. Rice expresses the opinion

that while the efforts of some of the larger manufacturing houses to standardize the preparation of such drugs as ergot, digitalis and strophanthus, etc., on the basis of their physiological activity, are quite laudable undertakings, it is safe to infer that, as long as a uniform method of physiological testing (for each separate drug requiring it) has not been agreed upon, the products of the different houses will turn out uniform only by accident. But whenever the medical profession shall be able to offer methods of physiological testing which will show both the *quality* and the *quantity* of effect, and which are *accepted by a majority of competent judges*, then such tests may well be introduced into the Pharmacopœia, even if they should involve special skill and knowledge not possessed by the average pharmacist at the present time.

Speaking of the problems that confront the revision of the Pharmacopœia editorially, Prof. *Edward Kremers*, Ph. G., says: "During the past months much has been said and written about the new edition of our national standard. The real question is not whether the 8th edition of the United States Pharmacopœia is going to be better or worse than any of the recently revised, or about to be revised, pharmacopœias, but whether it is going to meet the actual demands of the first few years of the twentieth century; in short, whether it is going to be a scientific fossil or a live treatise which both physician and pharmacist can and actually will use. In this it is not intended to be in any way disrespectful to the present standard, nor to cast any reflection upon its revisers. It was a comparatively easy matter to include in the earlier pharmacopœias, which were written for the guidance of physicians and apothecaries of comparatively small communities, everything that was of any importance whatever, but if we follow the development of pharmacopœias, we become aware that, especially in this century, we have more and more gotten away from the old standard, and so much has this been the case in recent decades that, while an evil to some, and a fetish to be worshiped to others, to most physicians and pharmacists pharmacopœias have become a byword—a condition which applies with the same force to the different European states that it does to our own country.

Without desiring to belittle any of the important problems that have been discussed during the past year, such as the extension of the principle of standardization, the "ethics" of admitting patented chemicals, the introduction of average or maximum doses, the questions of introducing or rejecting this, that and the other drug or preparation, these, one and all, appear to the editor insignificant when compared with the fundamental problems, whether the U. S. Pharmacopœia is to continue primarily a code, which is of comparatively little use to the physician if not to the pharmacist, or is to be converted into a modern scientific treatise that may be made a boon to both the pharmaceutical and medical professions. The fact of the failure of the Pharmacopœia as a code becomes apparent when

we stop to consider that so many physicians have ceased to prescribe official preparations, and in their stead prescribe the corresponding preparations of manufacturer So and so; that much of their medical armamentarium consists of well-defined compounds, and of galenical preparations not at all contained in the Pharmacopœia. Moreover, the pharmacist, who apparently stands by his Pharmacopœia through thick and thin at association meetings, when at home never takes the trouble to apply its directions to actual practice. Then, why not supply the physician with information that is less biased and more authoritative than that of the manufacturer? Why make the pharmacist so largely dependent on his journals, which are of necessity hastily compiled? The ideal Pharmacopœia is an up-to-date treatise that contains concise information with regard to every drug and preparation the modern physician may want to prescribe. It is one that changes with every step of scientific progress, but not necessarily by annual or more frequent revisions, rather by circulars advising of changes made according to the best judgment of the Committee of Revision, and possibly an annual addendum comprising all of the information of the circulars.

Speaking of the preliminary work done by the Committee on Revision of the Pharmacopœia of 1890 towards the Revision of 1900, Prof. Kremers says: "Europeans have not only made favorable comments on the last Pharmacopœia, but have praised the American way of constantly working at the revision of our national standard more than anything else. It should be a cause for gratification to American pharmacists that in this respect also they have been much more active than their medical confrères. Besides sharing in the responsibility of deciding the general policy of our national standard, the medical fraternity is not as keenly interested in the make-up of the Pharmacopœia as are the pharmacists, Whatever may be the individual tastes and opinions of those who go to Washington next month as the delegates of our calling, they should remember that what the American pharmacist wants is not academic discussion, but practical relief from a position that has become almost intolerable."

In response to an invitation issued by the editor of the "Bulletin of Pharmacy" to some pharmacists, physicians, teachers and manufacturers. to express their opinion regarding the changes which should be made in the Pharmacopœia of 1900, and particularly on the advisability of incorporating doses, recognizing patented synthetics, and extending the principle of standardization, a number of replies were received. Those concerning the

Popularization of the Pharmacopœia are briefly as follows: Prof. *H. A. Hare*, M. D., says that there are two chief reasons why at the present time the U. S. Pharmacopœia is practically never used as a work of

reference by physicians: First, because it contains very little information that is of use to the physician in his practice; and, secondly, because what little it does contain which is of use to him can be found in other works of reference which are constantly employed. Unless it contains additional information over and above that now contained in it, the U. S. P. will, he believes, become less and less referred to by practitioners; but whether it is wise to add anything more is a debatable question. Personally, he feels that the Pharmacopœia is a standard which must be set up for physicians and pharmacists, but that while it must be a hand-book of the pharmacist, it can only be a reference-book for the practitioner of medicine. *Mr. S. A. D. Sheppard, Ph. G.*, fully agrees with the opinion expressed by the editor of the Bulletin of Pharmacy, that "during the time which has elapsed since the last revision a feeling has been growing that the Pharmacopœia, despite its great and acknowledged excellence, does not lend itself sufficiently to the purposes of pharmacists and physicians to become the popular hand-book that it indisputably ought to be for the best interests both of pharmacy and medicine." The Pharmacopœia has always been a record simply of established facts in pharmaceutical science; therefore a follower and not a leader of medicine and pharmacy. During the rapid changes that have characterized the nineteenth century, this country has gone forward by leaps and bounds, and why may it not now take an advanced position in the year 1900 and give to its Pharmacopœia an advanced and changed character which no Pharmacopœia has previously had? The book surely ought to be made more useful for the hourly and daily needs of both physician and pharmacist. Prof.. *R G. Eccles*, M. D., says that anything that can be suggested that will tend towards popularizing the Pharmacopœia is greatly desired. To bring it into popularity among medical men it must become a standard reference book in therapeutics as well as in pharmacy; but this is at present deemed beyond its province. Prof. *Lucius E. Sayre*, Ph. G., says that we should certainly try to make the U. S. P. "lend itself sufficiently to the purposes of the pharmacist and physician to become the popular hand-book for both that it should be," but there are other ways of doing this than by making it a "popular" book in the 1900 revision. Prof. *Frederick J. Wulling*, Ph. G., expresses the opinion that much could be done to make the U. S. P. more popular by introducing it as a text-book in *all* medical colleges. It ought to be the text-book for at least materia medica. Mr. *Seward W. Williams*, Ph. C., says: "That the Pharmacopœia is not the popular book it should be among pharmacists and physicians is due far more to rapidly changing conditions than to any fault in the book itself, or on the part of those for whom it is intended. To be popular it should be a book of ready reference." "It should be an authoritative guide to the gatherer of medicinal plants, and to the manufacturing pharmacist, as well as to the dispenser. The word 'official' should mean much all along the line."

Interesting papers in the same direction also are those of Mr. *Lyman F. Kebler*, and of Prof. *G. D. Hinrichs*. Disclaiming the intention of finding fault, Mr. Kebler in a dispassionate spirit submits some criticisms, comments and suggestions concerning the direction in which the eighth decennial revision of the Pharmacopœia of the United States may correct some of the imperfections and inconsistencies of the Pharmacopœia of 1890, a work which, notwithstanding, is conspicuously a monumental record of American progressiveness. Its standards are of exceptional value, and the more we study its contents, the more are we impressed with the fund of knowledge possessed by the various workers who assisted in its compilation. But some of them placed their standards so high for some chemicals that the ideal rather than the real seemed to have been in mind. The requirements are frequently those of C. P. articles, and, in consequence, some of the best manufacturers have literally refused to make some of the U. S. P. articles so as to comply with that standard at current prices. Then, again, the Pharmacopœia contains a number of analytical methods which are either impracticable of application, or, if applied, lead to erroneous conclusions. Such, Mr. Kebler submits, had far better be omitted than to encourage an expenditure of time and money for results that are worse than useless. It, moreover, frequently happens that a test or method or standard of to-day is rendered perfectly useless by the investigation of to-morrow. For these reasons it appears to him that it is undesirable to adopt the Pharmacopœia as a hard-and-fast standard, but rather let the Pharmacopœia be the guide, supplemented by all other available standard literature. To cite a few inconsistencies the author mentions sodium benzoate, from which, according to the official tests, the presence of a chloride is rigidly excluded; yet the requirements of both sodium carbonate and bicarbonate, which are supposedly employed for its preparation, allow a limit of chloride. Then, again, potassium citrate is to be 100 per cent. pure, chlorides and sulphates being rigidly excluded; yet citric acid is allowed to have a limit of sulphuric acid, and potassium carbonate and bicarbonate are both allowed to contain a limit of chloride. Furthermore, limitations ought not to be so exacting, excepting where absolutely fresh material is necessary, as to be applicable to a preparation only once, and that when freshly prepared. The standard ought to allow a reasonable degree of variation for products that are prone to change under the most favorable environments—such as the spirits of ammonia, bleaching powder, tincture of iodine, spirit of nitrous ether, &c. In fine, Mr. Kebler is of the opinion that in prescribing standards for the U. S. P. the following three propositions should be rigidly kept in mind:

1. The standard of all U. S. P. preparations, drugs and chemicals should be so adjusted that they are not only satisfactory medicinally, but that they can also be manufactured from other U. S. P. goods, which enter into their preparation either in part or as a whole.

2. The requirements of all U. S. P. goods should be such that they can be employed in the manufacture of all other U. S. P. goods, of which they form an integral part, either in part or as a whole.

3. The best medicinal goods available should form the basis of all standards.

The present Pharmacopœia is frequently at variance with these propositions. When standards are so exacting that not a single manufacturer's goods will comply with them, these standards must of necessity become dead letters, and of non-effect. In regard to methods for determining standards, the author considers it more important to include in the next Pharmacopœia concise methods for determining the melting points, specific gravities and other constants, of certain substances, than to devote so much space, particularly in the way of repetition, to volumetric work. The claim sometimes made that these repetitions are necessary so as to make each set of tests complete in itself, is met by the argument that it is easy to turn to the tests in their proper places if the Pharmacopœia is known to the worker at all.

Prof. *G. D. Hinrichs*, Ph. G., calls attention to the powerful agitation in favor of a national pure food law and of the probable importance to the business interests of the retail druggist in the light of pharmacopœial requirements, present and to come. The Pharmacopœia is the self-imposed law governing the druggist in the mode of preparation, and especially in the chemical purity and strength of the articles described therein. The druggists of Ohio were a few years ago quite rudely awakened to the requirements of this self-imposed law-book, in connection with the attempted enforcement of a so called pure food law for the state, and, as a rule, even the best and most honorable men plead guilty and paid the costs. As a matter of fact, any merely technical statement in this book becomes of practical weight in the courts, and it behooves us, therefore, to see to it that the revision now about to be made shall be placed into hands of men who will not allow far-fetched, non-essential conditions to be imposed, and certainly none that it is practically impossible to meet. Our Pharmacopœia has become a big volume. It is swelling up toward the dimensions of a dispensatory and has absorbed a goodly portion of what exclusively belonged to chemical literature; whereas it should not contain a word that is not essential, and if essential, it should be printed in prominent type so that it can easily be read by the druggist who is bound in law by that word. If the Pharmacopœia be revised on such lines, it will lose fully four-fifths of its present bulk, and the loss will be merely irrelevant, merely technical matter, that can only serve to tangle the druggist in the coils of a pure food law, such as they make them in our legislatures. Under a revision such as Prof. Hinrichs favors, the Pharmacopœia will become a small, handy book, printed in large, readable type; will have room for doses in big type, will be obtainable by druggists at a minimum of cost, and will find its way into

every drug store in the United States, whereas the Pharmacopœia of 1890 has not found its way into one-fifth of the drug stores of the country. It will fully guard the legitimate interests of the people, but no less protect the business and moral interests of the retail druggists.

The "Bulletin of Pharmacy" replies to the "Question of Doses" are with a single exception favorable to their introduction into the Pharmacopœia in some form or other. Prof. *H. A. Hare*, M. D., believes that a table of *approximate* doses should be inserted, with the statement that they are approximate, not exact, and that in many instances doses far larger or far smaller must be used according to the needs of the case. Mr. *S. A. D. Sheppard*, Ph. G., favors the insertion of a table of doses. Prof. *R. G. Eccles*, M. D., considers the question of introducing doses a very serious and perplexing one. There is no such thing as an absolutely fixed dose, either mean or maximum, that will apply to all alike. No standard of doses can be fixed. To put into the Pharmacopœia a table of doses would be to put into the hands of lawyers, ignorant of medicine, a dangerous weapon. It would always stand like a sword of Damocles hanging over the heads of our best physicians. Prof. *John Uri Lloyd*, Ph. G., believes that with all energetic drugs a table of maximum doses is desirable, but does not see any object in attempting to give minimum doses, nor of any doses where such innocent drugs as taraxacum are concerned. Prof. *E. L. Patch*, Ph. G., believes that until dosage rests upon a more accurate and reliable basis, and until we have a tribunal capable of harmonizing all the various and conflicting testimonies concerning the action of doses and remedies, it would seem wise to admit only a table of maximum single and daily doses for all preparations which are active enough to cause danger if too wide a range of dosage be allowed. Professor *Willis G. Tucker*, M. D., emphasizes that it is advisable to append a table of doses, or to state these in the text in connection with each article which is used internally. Prof. *H. V. Arny*, Ph. G., heartily favors a maximum dose-table as a means of sparing the careful pharmacist many a bad quarter-hour. Prof. *Frederick J. Wulling*, Ph. G., advocates the introduction of a table of doses—average for adult and maximum, with a clause requesting physicians to note specifically upon prescriptions whenever they write for more than the printed maximum. Mr. *W. W. Kerr* is heartily in favor of the introduction of doses as a concession to the practical usefulness of the standard—not because the innovation properly belongs to a Pharmacopœia. Prof. *H. M. Whelpley*, M. D., says that the introduction of doses will increase the popularity of the Pharmacopœia. Mr. *Seward W. Williams*, Ph. C., observes that we have weighty precedents to guide us in the introduction of doses into the Pharmacopœia. How this may best be done is shown in the British and German Pharmacopœias. Dr. *A. B. Lyons* maintains that doses should be given in the Pharmacopœia, not for the information of

physicians, or as a guide in therapeutics, but that the pharmacist, who is expected to keep a critical eye on physicians' prescriptions, may have justification when he believes that an overdose of some powerful remedy has been prescribed. Mr. *Wilhelm Bodeman* says, "When a pharmacist is uncertain about a dose he wants to find it somewhere quickly, and when found he wants it to be authoritative. If the Pharmacopœia is not 'official' enough to be *the* guide in doses, it is short of its purpose."

The Introduction of Synthetics also is voiced in the affirmative but not with unanimity, and there is considerable difference of opinion with regard to the extent to which this should be done. Prof. *Adolf G. Vogeler,* Ph. G., reviews the arguments, *pro* and *con*, that have been brought to bear on the proposed admission of patented synthetics. While conservative pharmacists, recognizing the necessity of introducing certain synthetics, do not consider the existence of a patent covering their production a bar against their admission into the U. S. P., the medical fraternity, as represented by the Section of Materia Medica, Pharmacy and Therapeutics in the American Medical Association, endorses the admission of patented synthetics without qualification. But the members of the medical and pharmaceutical professions are by no means a unit on this important question as here presented. Objections are made to this admission on the ground of ethics, for the reasons that it is wrong to hold a patent on a medicinal product, that official recognition would seem to advertise them to the advantage of the patentee, etc.; while it is urged in favor of the proposition that a Pharmacopœia essentially is designed to establish standards of composition, strength, purity, and to fix identity and nomenclature, and that with ethics the Pharmacopœia has little or nothing to do—such concerning the physician, who determines for himself what and what not he will administer to his patients. The strongest argument, perhaps, put forth against official recognition of patented chemicals is that in this country not only the product and the process are protected, but that the monopoly is fortified in perpetuity by a trade-mark of the name. But this formidable objection has lost its force since the recent United States District Court decision, declaring that there can be no proprietary right in the name of a patented article after the expiration of a patent. Consequently at the expiration of the patents the trade-names by which they were originally designated will be free and part of the language. It will, therefore, be perfectly proper for the Pharmacopœia to accept the inventors' names as its own, and thereby help to establish them as generic names, introducing their proper chemical designations as synonyms; or the order may be reversed, the commercial trivial name taking its place as a synonym.

Discussing the same subject, Dr. *S. W. Williston* says that the question, "Must remedies remain unofficial so long as their manufacture is a monopoly?" may be considered from the standpoint of policy, of utility, or of ethics. The medical profession has long looked with disfavor

upon the patenting of any device, instrument or medicine intended to alleviate human suffering. The motive is an ideal one, doubtless, but it is a very serious question whether humanity has been the better for such a system of ethics. He believes the patenting of a newly discovered synthetic, if under proper safeguard, to be for the best interests of mankind, and that its advisability should not be a question of ethics. As regards the standpoint of utility, the Pharmacopœia is a work prepared primarily for the physician, and secondarily for his agent, the pharmacist. The physician does rightfully insist that he shall have the opportunity of knowing, in an unprejudiced way, all that there is known about such medicines, so far as this knowledge affects himself or his patient. It seems to be beyond all reasonable dispute that a remedy widely used and of proved value must find admittance to the Pharmacopœia, no matter where made, or by whom, or what it costs. As to policy, the claim that a perpetual monopoly is likely to be created for the manufacturer by the admission of patented synthetics, is not well founded, although there is some validity to the claim that such recognition will give free advertisement to such compounds. But, so long as they are used generally by physicians and spoken of in the medical journals, the additional advertisement will be slight indeed. Moreover, the committee of revision may be relied on to admit only such synthetics as have stood the test of experience; and if they remain indispensable additions to the physician's stock, then nothing will more quickly break up the monopoly of their manufacture, after their patent has expired, than their recognition by the Pharmacopœia under their true scientific names.

The response to the "Bulletin of Pharmacy" inquiries are as follows: Prof. *H. A. Hare*, M. D., is opposed to the insertion of synthetic products, because it will be almost impossible to draw a line between the worthy and unworthy, because the influence brought to bear by some manufacturers will be evil in its effects on the Convention, and because the Pharmacopœia is designed primarily to tell us how to prepare drugs, and is not a list of names of synthetic products; it is essentially a recipe book, not a directory. Mr. *S. A. D. Sheppard*, Ph. G., favors a recognition in some way of patented synthetic remedies. Prof. *R. G. Eccles*, M. D., had stood up against the majority in the Convention of 1890, and defended the wisdom of introducing patented synthetic remedies. The experience of the last ten years has but increased the strength of his conviction that it would be almost if not quite a crime to rule them out. Prof. *John Uri Lloyd*, Ph. G., believes that the formulas and the names of definite synthetic chemicals used in medicine by prescribing physicians should be recorded in the Pharmacopœia, whether they be patented or trade-marked. But he is not in favor of extending the principle to the proprietary remedies, which are mere mechanical mixtures. Prof. *E. L. Patch*, Ph. G., evidently considers that the propriety of introducing patented synthetics

stands on very debatable ground. His own position is that patented synthetics, on which the trade and the public are compelled to pay excessive and fictitious values, should not be given a place in the Pharmacopœia, in view of the fact that there is no reason to fear that the medical profession or the general public will be kept in even partial ignorance of their value, action and dosage. Prof. *Willis G. Tucker*, M. D., does not favor the recognition of patented remedies in the Pharmacopœia in any instance. Prof. *H. V. Arny*, Ph. G., says that to put patented synthetics into the Pharmacopœia of 1900 would be a grave error. Our authority should treat only of such medicaments as have enjoyed high reputation for at least a decade; those products whose process of manufacture is patented can safely wait until the expiration of the patent before being introduced into the Pharmacopœia. Official sanction should be conferred only when a product has become so invaluable, is used so often, that every bit of knowledge concerning it is essential to the physician and the pharmacist. Few indeed are the patented synthetics, unbolstered by the popularity coming from advertising, of which this can be said. Prof. *Frederick J. Wulling*, Ph. G., says that all substances found valuable as remedial agents and prescribed by physicians should be recognized by the U. S. P., and their purity, strength, etc. there designated. Mr. *W. W. Kerr* is emphatically opposed to the introduction of any synthetic remedies except in such cases where the process is not patented, or where the chemical may be manufactured by some other process than the patented one. Mr. *Seward W. Williams* says that we find precedents for the introduction of patented synthetics established in those strongholds of conservatism, Germany and Great Britain. Unquestioned merit and the widest medical indorsement should warrant official recognition. Dr. *A. B. Lyons* asks, why should synthetic remedies not have official recognition? The questions that must be asked with regard to each remedy that claims a place in the materia medica are: First, is it free from the taint of secrecy? Secondly, has it real merit as a therapeutic agent? Thirdly, has it commended itself in the clinical experience of physicians so that it is likely to come into general use? These questions being satisfactorily answered, the claimant should not be refused recognition. Mr. *Wilhelm Bodemann* says that he is so prejudiced against our infamous (patent? Rep.) laws that he is opposed to recognizing any remedy that has attached to it the odium of a patent on the substance itself.

The Question of Standardization, however, appears to have engaged the most wide-spread interest, not only by single individuals, but by associations as well, being the subject of discussion at numerous meetings. Thus the subject of the standardization of drugs and their preparations was introduced at a meeting of the Alumni Association of the Chicago College of Pharmacy, held for the purpose of discussing pharmacopœial revision, by Dr. *George F. Butler*, who spoke of standardization as viewed by the

physician. The necessity of uniformity and reliability of the medicines used by the physician was strongly dwelt upon as being of the first importance; the variation in medicinal value of drugs grown or collected under varying conditions was pointed out, and the difficulties in determining to just what principles the physiological activities of some drugs are due were indicated. The speaker thought there was no difference of opinion among those engaged in medical service generally concerning the desirability of standardization, the question being as to how far standardization is practicable. *A. D. Thorburn*, Ph. G., gave the pharmacist's view of the subject. While conceding the desirability of the pharmacist being able to furnish a uniformly active and reliable medicine, he thought that great care should be taken that the requirements be not too exacting. The personal equation enters so largely into analyses, especially with the apparatus within reach of the every-day pharmacist, that a certain amount of latitude should be allowed. It mattered little to the prescriber, probably, whether a fifteenth or sixteenth of a grain of the active ingredient was contained in the teaspoonful dose. Prof. *W. A. Puckner*, Ph. G., discussed the subject from the chemist's standpoint. He thought that while others perhaps might wish only a few drugs standardized, the conscientious manufacturer probably would desire to have all drugs standardized, if not in alkaloidal strength then in amount of extractive matter, color, taste, or anything tangible. He believed there were decided objections to exact standardization. Moreover, physicians did not demand absolute exactness, and there was no need of it. Physiological tests are of no value in determining the accuracy of chemical tests, which should go before.

In the responses to the "Bulletin of Pharmacy" questions on the standardization of galenical preparations, Prof. *H. A. Hare* expresses himself heartily in favor of standardizing all galenical preparations that can possibly be standardized, and believes that the physician who employs non-standardized galenicals does a wrong to his patient and to himself, for obvious reasons. Mr. *S. A. D. Sheppard*, Ph. G., is in favor of the policy of applying farther the principle of standardization to galenical preparations. Prof. *R. G. Eccles*, M. D., says that it is but the dictum of common sense that everything that can be standardized should be standardized. Prof. *John Uri Lloyd*, Ph. G., says that the principle of standardization should be carried out as far as practicable to the preparation of energetic drugs, but that with each drug an upper and a lower limit should be established. In the case of alkaloidal drugs possessing more than one alkaloid, the standardization should, if possible, refer to the energetic constituent. Such standardization is not to be understood, however, to standardize the *drug* as a whole, but its dominant, energetic constituent. A liberal limit of variation should be allowed in the case of unstable preparations, and a fair limit of variation established in the valuation of plant products. Prof. *E.*

L. Patch, Ph. G., considers it certainly desirable to adopt methods of standardizing galenicals as rapidly as reliable processes are determined. Such standards should be adopted by the Pharmacopœia as can be practically maintained and can be arrived at by any trained pharmacist. Prof. *Willis G. Tucker*, M. D., approves of the standardization of galenical preparations in so far as it is possible. Precision should be aimed at, but limits for allowable variations in the case of active constituents should be established. Prof. *H. V. Arny*, Ph. G., while strongly favoring the standardization of galenicals from the educational standpoint, questions whether we have yet devised methods of assay that will warrant the material extension of the principle of standardization in the Pharmacopœia of 1890. Prof. *Frederick J. Wulling* would favor a further application of the principle of standardization to galenical preparations wherever it is possible so to do. Mr. *W. W. Kerr* favors the extension of the principle of standardization as far as it may be done within the limits of the capacity of competent retail pharmacists, and the means at hand in any well-ordered retail pharmacy. Mr. *Seward W. Williams*, Ph. G., expresses the opinion that the adoption of definite standards upon which manufacturers can unite, whether or not the processes of standardization involved are within the scope of the retail druggists' time and facilities, is of greatest importance. No one will benefit more than the dispensing pharmacist from the introduction of such standards, for physicians would probably find it unnecessary to specify a particular make in order to secure uniformity in essentials. Dr. *A. B. Lyons* is emphatically of the opinion that the principle of standardization should be further extended to galenicals as rapidly as trustworthy processes are devised, but believes that it is still more important to insist on certain standards for the crude drugs themselves, and to demand that such drugs be sold only on guaranteed assay. Mr. *Wilhelm Bodemann* says "Standardization should be approved by everybody."

Prof. Adolf G. Vogeler, Ph. C., says that the pressing need for fixing standards and tests for remedies of vegetable origin is universally admitted, but in the minds of many there are serious doubts as to the practicability of such an undertaking, and it is but natural that men should not all arrive at the same conclusion concerning so difficult and intricate a question. There is apparently a growing tendency on the part of the laboratory chemists of the advanced type to become agressively offensive and to stigmatize all those not completely in sympathy with them as unprogressive and antediluvian. But there are many thoughtful men better qualified to judge than the theoretical laboratory chemist or the financially interested manufacturer, who are not yet persuaded that the determination of one constituent determines the relative therapeutic value of a vegetable drug—and especially not of a drug extraction. There are therapeutists who hold that the medicinal properties of such a drug are fully and best represented by the proximate principle itself upon which the standardiza-

tion is to depend, while there are others, quite as reliable in their profession, who claim that in many instances they have better results from the drugs themselves than from their isolated active principles. The former has no need for standardized drugs, because he does not, or ought not to, use the complex drug form. Those who insist on standardization should remember that the manifold plant constituents are the result of plant life, and that in normal plants, under normal conditions, the relative proportions of the various constituents are approximately uniform. When conditions change, the life of the plant becomes abnormal, and then the products of its life activity are not present in normal proportions. When a plant produces an abnormally large proportion of quinine, there will be a disproportion between all the other constituents, and not, as might be assumed, a proportionate increase or decrease of all alike. This assertion may be based largely on theory, but there is sufficient experimental evidence on record to justify the same. Accumulated experience of the past has taught us what, ordinarily speaking, is a "good" plant. Observation based on clinical experience has taught us under what conditions of climate and soil the "best" plants are produced; we have learned to recognize them by physical properties, and know at what periods of growth they are best gathered. These, then, may be accepted as "normal" plants, and their juices and deposits may be said to be present in normal proportions. A series of assays under well-defined conditions of such selected "normal" plants will give us the percentage of principal active constituent, and we shall discover that this fluctuates within certain limits, the greater number of figures varying not so very much from a certain percentage. These tests will show, then, that a "good" drug contains an amount of active principle ranging within reasonable limits, and such drugs are "standard." Following these lines, let the Pharmacopœia fix a minimum and maximum limit of the chief active principle in a given drug, indicating the precise method of assay, not omitting, of course, the customary definitions and descriptions of the drug. Let the Pharmacopœia direct that the preparations, specifying the process, be made from such assayed drugs, and permit no other. Let the minimum limit of active ingredient for the crude drug also be that for the finished product.

Mr. *Alfred R. L. Dohme*, Ph. D., in a paper (Drugg. Circ. Sept., 1899), on the problems confronting the revision of the U. S. P., also deals mainly with the problems of standardization. He says, the revision of a Pharmacopœia is at all times a Herculean task. It is also an unending one, for, although the Committee undertaking the work is appointed only once in ten years, the resulting revised edition represents the accumulated labors continuing throughout those ten years. When the last revision was effected, the subject of standardization of galenical drugs was in its infancy, and the Committee in consequence only touched upon the subject.

Synthetic products were also then in their infancy, while the subject of the essential oils was largely a closed chapter, and the subject of plant secretions was as yet entirely in a maze of mystery. Nobody knew what these resins and gum resins were, and practically nobody wanted to know. Now we have dispelled the gloom then enveloping us, and the pharmaceutic advances during the past ten years far exceed in extent and importance those of the present two decades combined. At that time chemistry was taught and practised as a science *per se*. Since then it has developed disciples that have branched off from the beaten track and developed paths as branches of the main road, alongside which workers in associated sciences might mend their steps and their thoughts. One of these paths is labeled "pharmaceutical chemistry," and those disciples who received their enthusiasm and early training in the pharmacy and then became devotees to the pure mother science, again directed their energies to the application of what they learned while under the wings of their first love, pharmacy, and as a result evolved from pharmacy's hidden treasure chest facts of startling beauty and value. Dr. Dohme is firmly convinced that the advances that have been thus brought about must be reflected in the forthcoming revised edition of the U. S. P. There can be no doubt in any one's mind that the only correct way to dispense drugs or their preparations is of a uniform medicinal strength. To say that digitalis is digitalis, or opium is opium, is old-fogy, and the standpoint that justifies it is a benighted one. He firmly believes, for instance, that it is incumbent upon the Committee of Revision to estab a definite standard of strength for digitalis, and he would have this standardization extended to many other drugs, even if it be necessary for the committee to seek for methods of standardizations in the case of drugs, for which none now exist. Physiological tests are, however, of comparaticely little value for standardization, and signify merely that the drug does possess a certain but not a quantitative value. The pharmacopœial requirements for essential oils can now also be defined with some degree of accuracy, and where our knowledge of some of these is still incomplete, it should be within the province of the committee of revision to institute investigation, and if possible supply it. A problem that will be somewhat difficult to solve is the admission of synthetics, controlled by individuals. Some of these are among the most commonly and successfully used medicaments, and it would appear pedantic not to admit such. Another problem of importance is that of maximum doses, about which there has been considerable controversy. But come what may, the New Century Pharmacopœia will, without a doubt, be a very worthy and valuable volume, and will represent the great advance that has been made during the past decade.

Similarly, Mr. *S. W. Williams'* paper (Drugg. Circ., Sept. 1899) entitled "From a Book of Formulas to a Book of Standards," deals princi-

pally with the subject of standardization. He says, in the perfection of official pharmaceutical products, manufacturers are setting such a swift pace as to make the task of bringing the Pharmacopœia up to date a difficult one. A glance at the Pharmacopœias of 1870, '80 and '90 reveals that from a chemist's and druggist's formulary, coupled with a condensed catalogue of materia medica, the volume has been gradually changing towards a book of tests and standards, and conditions are such as to require continued and rapid advance in the same direction. The same process of evolution has been apparent in the British Pharmacopœia, formulas in this as in our own standard having given place to "characters and tests," while processes for standardization and assay have been adopted as fast as was deemed consistent with wise conservatism. There is the best reason for all this, and a great advance is naturally to be expected along the same lines in the coming revision of the U. S. P. To multiply the facilities and extend the field of the pharmacist as an expert in determining the strength and purity of remedial agents, is probably the greatest work of the Pharmacopœia; but the relation of the book to manufacturing pharmacy is of very great importance, and it would seem desirable that the Pharmacopœia should, in so far as possible, establish standards for the guidance of manufacturers, even if the required methods should not be adapted to the retail pharmacist. Uniformity can in no other way be better secured, if, indeed, it can be arrived at at all. As it is now, one manufacturer adopts what he considers a proper standard for his preparation of some potent drug; even if he publishes his methods in detail, his competitors may honestly disagree with him or object to the apparent lack of independence in copying. They are quite likely to introduce standards of their own. They must be different from the original, and other reasons for the differences are readily presented. Until, therefore, there are authoritative standards, there is the best reason why the physician should specify the particular make of medicines with which he is most familiar. That, for one reason or another, he will always do so to some extent is quite probable, but that it should be necessary, in order to secure uniformity in essentials, is most unfortunate. It seems, therefore, that the best methods of standardization and valuation which are found to be practically attainable by the manufacturer, with the superior facilities at his command, should be adopted as official, whether or not they are beyond the scope of the retail pharmacist. In so far as such standardization can be accomplished, just in so far will the word "official" mean enough to do away with the necessity for specification or prescriptions calling for pharmacopœical preparations. Everything possible should be done to make it unnecessary for the retail druggist to stock more than one or two lines of regular official preparations.

In connection with the subject of standardization as viewed by American authorities, it may be well to quote some British authorities on this

and kindred subjects. The processes of alkaloidal standardization adopted by the British Pharmacopœia of 1898 has been the subject of unfavorable criticism and discussion by numerous writers, beginning practically with the day when that book appeared in print. This is the more remarkable when the vast amount of preliminary work is taken into consideration that had been done before the text of the Pharmacopœia was finally accepted for publication. Any discussion, therefore, that will enlighten us as to the probable reasons why these processes should have proven so defective—if so they be—as to require improvement or modification, must be welcome, and as such must be regarded the recent paper, read by Mr. *John A. Dewhirst* (Pharm. Journ., April 7, 1900) before the Chemist Assistants' Association, London, in which he discusses some of the reasons why these and other processes of alkaloidal assay may prove unsatisfactory. Mr. Dewhirst observes that "When one turns to the chemical and pharmaceutical literature concerning the determination of alkaloids in plants and their preparations, one is struck by the great amount of work that has been done on the subject, by the great similarity of the numberless processes suggested, and again by the conflicting accounts of the efficacy or otherwise of the latter. The differing constituents of a particular species of plant, according to the nature of its surroundings during growth, the time of collection, the strength of alcohol used in making the extract or tincture, and the varying methods as to heat, etc., employed by manufacturers, account for this discrepancy to a large extent. The 'personal equation' of the analyst has a good deal to do with it. Details of manipulation employed by one, but considered too unimportant for publication, make his process quite unworkable by another, and hence arise the multitude of processes. After all, we are dealing with only one class of chemical substances, and consequently one process only might be expected to suffice for all cases. Speaking broadly, it does. Chloroform is undoubtedly the best all-round solvent of alkaloids, and when a liquid preparation containing one or more of them is made alkaline and shaken with it in two or three quantities the alkaloids are extracted. Subsequent treatment of this chloroform solution with acidulated water extracts them again, and leaves coloring matters and other substances in the chloroform, whilst the alkaloids are now in a fairly pure condition in the aqueous solution, and can be dealt with according to the particular preference of the analyst. They can be precipitated by various reagents, such as tannic acid, picric acid, iodine, mercuric or bismuth iodides in presence of potassium iodide, phosphomolybdates, or sulphovanadates, filtered off and weighed, or the precipitate decomposed and the alkaloid extracted in a pure condition. Or they may be titrated with standard solutions of the above. The results, however, are not reliable in most cases, and in the others there seems no advantage over the simpler method of titrating the alkaloid residue with standard acid. Prescott has devised some rather elaborate methods of

determination by precipitation with standard iodine, filtering off an aliquot part, and titrating the excess of iodine with thiosulphate. The somewhat uncertain composition of the iodine compound, and in cases the extreme dilution of the alkaloidal solution, probably introduce more error than in the above simpler method."

Mr. *Edmund White*, pointing out some imperfections in the B. P. method of standardizing liquid extract of cinchona, says that with regard to standardized galenical preparations generally, it seems to him that the period of time during which most of the potent vegetable drugs should be employed in this form is distinctly limited. For, if any process of standardization is to provide us with preparations of constant and known potency, it follows that we must be in possession of information which enables us to state (1) what proximate principles are contained in a drug, and (2) their relative value as remedial agents. If our knowledge is not sufficiently advanced to do this, the value of the standardized preparation as a real standard may easily be overrated. Standardized galenicals can only be regarded in many cases as temporary expedients suitable for the transitional period when we are passing from an incomplete to a definite knowledge of the constituents of a given drug. The logical consequence of their employment ought to be their substitution by the pure substances which have formed the basis of standardization. In following this line of argument, Mr. White is quite aware that he touches an old controversy with regard to the relative medicinal action of crude vegetable drugs and the active principles contained in them. What he wishes to point out is the fallacy of regarding standardized preparations as the limit of pharmaceutical perfection. So soon as our knowledge of the composition and action of drugs becomes sufficiently definite to enable us to create processes of assay to yield standard preparations, using the term in its extended sense, then the time has arrived for the employment of the active principles to the exclusion of galenical preparations except in certain exceptional cases.

At the Plymouth meeting of the British Pharmaceutical Conference, Mr. *C. G. Moore* and Mr. *C. H. Cribbs* contributed a paper on

"Standards of Purity of Drugs and Foods," in which they call attention to the necessity of fixing these standards, one of the principal difficulties encountered by the public analyst in his work under the "Sale of Food and Drugs Act" being the lack of information upon which to base the conclusions to be drawn from his work. Without such, where and how is he to draw the line separating the genuine from the adulterated sample, or from a sample of inferior quality but not adulterated? In the case of foods, for instance, the question may be considered: "What is the composition of the ordinary articles in every-day use which we should consider as satisfactory evidence of their genuineness? There are some three

hundred articles which would properly come under the jurisdiction of the Food and Drugs Act, and it is the opinion of the authors that in the case of many of them some mutual agreement might be come to which would result in the adoption of a convenient standard, at least provisionally. The authors are now engaged in collecting, as far as possible, figures on the composition of the three hundred or more articles mentioned, the scheme under which they are dealing with each article being as follows: The name of each article, its definition and description, its adulteration, the standard, where possible, or where sufficient information does not exist to formulate a standard, its average composition, closing with reference to recent literatures, and concluding remarks having a bearing upon the particlar article. In their present paper a number of examples are given, embracing tinctures, foods, and crude drugs, in which these suggestions have been embodied.

Referring to the foregoing paper and to a more recent report by Mr. Moor as public analyst for the City of Exeter, a writer in "Pharm. Journ.," Feb. 3, 1900, under the signature of "an ordinary pharmacist," observes that if the average composition of genuine drugs, etc., be arrived at according to Mr. Moor's idea, it would result in some cases in the adoption of a lower standard than that of the B. P., and in others it would probably be higher. the object being the not unreasonable one of fixing standards of purity which could readily be conformed to by traders prepared to pay a fair price for a satisfactory article. It would be, however, distinctly unfair to penalize retailers of drugs and galenicals for selling articles which are below standards that are unattainable in the ordinary course; at the same time, standards should not be fixed so low that the buyer of second-rate articles can offer them under the same designations as the higher-priced goods purchased by more conscientious and high-spirited dealers. If Mr. Moor can secure general acceptance of such views he will have done good service to the public and the pharmacists, but the author fears that the way must first be cleared by getting a legal decision of sufficient weight to make standards of purity essential in the case of drugs and galenicals sold in the ordinary course of the retail business.

H. Wippel Gadd (Pharm. Journ., Mar. 17, 1900), also referring to Mr. Moor's paper, observes that the same subject must always be differently viewed in accordance with the varying positions of those to whom it appeals. As to the advisability of standards being fixed, there can hardly be two opinions. The analysts need them, the wholesalers would welcome them, and the retailers would be wise to insist on their being established. For the safety of the public, for the convenience of the medical profession, and in the interest of all honest traders, it is imperative that standards should be defined. But if they are to be generally applicable, they must be settled by a general consensus of opinion. Analysts, in spite of, or perhaps, because of their training, are too often zealous without being discreet.

They seem to lack a sense of proportion, and forget that absolute purity is seldom compatible with commercial conditions. If left to them only, the standards would probably be fixed too high. The wholesale druggist, on the other hand, with his experiences of wide variation in natural products, may possibly be tempted to make the standards too broad, whilst the retailer is apt to draw general conclusions from limited data and isolated cases. But with the modern tendency towards factory-made goods, the question arises on whom the responsibility of maintaining the standards of such should rest. This, in the first place, is likely to be the manufacturer. But if retailers cease to make, they are still responsible for what they sell, and must, after satisfying themselves that they are right when taken into stock, see that they do not deteriorate whilst they are in stock. The author is confident that all wholesale houses (manufacturers, Rep.), are prepared to stand by their labels, and, if necessary, to especially guarantee that any particular article is up to standard when sent out; but no firm could be responsible for goods which have been for months beyond its control, and it is for the retail pharmacist to prove that he and his servants have kept the stock in a proper manner after it was received.

This introductory would be incomplete without some mention of *The Convention for the Revision of the Pharmacopœia of the United States*, held at Washington, D. C., May 2–4, 1900, which has now passed into history. In his admirable opening address to the convention, the President, Prof. Horatio C. Wood, M. D., corrects the misconception sometimes held that the Pharmacopœia of the United States owes its origin to the small Pharmacopœia which was published in Philadelphia, in 1778, for military purposes. It was the Counsellors of the Massachusetts Medical Society who, in 1805, first appreciated the need in America of a general Pharmacopœia; and it was the result of their labors, issued in 1808, that suggested to Dr. Lyman Spalding, of New York City, the formation of the National Standard. In the course of a brief historical review, he also called attention to another interesting fact, not generally known, that at that early date in our century pharmacists were accustomed to dispense medicines by weight only, but that the Pharmacopœia of 1808, though directing parts by weight both for fluids and solids, "sowed the tares which grew up with the wheat" by permitting the use of measures—provided they were of glass—for measuring "wine, water and aqueous liquids in some instances." A change from parts by weight to liquid measures was effected in 1820, notwithstanding the fact that even at that time the liquid measures were not in use by the apothecaries of America. But we are interested here more in what Dr. Wood said in regard to present conditions than with regard to the past, and the following, addressed specially to the delegates of the pharmaceutical associations present at the convention, may find place here, *verbatim*:

"I congratulate you on representing a profession which has attained its highest development in the United States." "There is a probably widespread, and certainly often spoken of, feeling that the medical profession of the United States does not properly appreciate and support the United States Pharmacopœia. There is some foundation for this feeling, but assuredly it is exaggerated. It is true that, owing to the activity of manufacturing pharmacists, and the number and skill of their commercial sales men (venders of samples), aided by the deficiencies of medical education and the peculiar childlike credulity which is so common in doctors, all kinds of proprietary mixtures and proprietary articles and extra-pharmacopœial remedies are largely used in the United States. It is so easy for the lazy doctor to write for Smith's Panacea for human ills, and so easy for the doctor who knows neither materia medica nor therapeutics to order Jones' Consumption Cure or Thomas' Kamianita, that so long as laziness and incompetence remain with us so long will this thing be done. But this is no fault of the Pharmacopœia, and no perfection of the Pharmacopœia will greatly influence it. Certainly any attempt to reduce the products of the Pharmacopœia to the level of the proprietary or patent medicine would be to destroy the dignity of the work, to bring it into contempt, and finally to uproot its influence. Under the influence of State law and of public opinion the average education of the American medical profession is rapidly and steadily rising; in this, and not in anything that this Convention or its committees can do, lies the hope of the future. Moreover, the intensity of the feeling that the American medical profession is not so thoroughly interested in the Pharmacopœia as it ought to be rests largely on a misconception of the intent of the Pharmacopœia and its relations to the medical profession. A Pharmacopœia is not intended to be a guide to practice, or a working book to be used by the doctor, but is really a hand-book of the apothecary. I do not believe that at any time or in any country Pharmacopœias ever had much sale among the medical profession; and each year, as the professions differentiate themselves more and more, as the doctor becomes less and less of a pharmacist, the tendency of the doctors to buy Pharmacopœias must grow less rather than more. The Pharmacopœia can only be popularized in the medical profession by making it a treatise on therapeutics —in other words, by causing it to cease to be a Pharmacopœia. So long as it is a Pharmacopœia it is the basis upon which text books and dispensatories are to be written; and it becomes through these treatises a guide to the medical profession. It remains the apothecary's *vade mecum*, with which in hand he does his work, and its sales must be chiefly among the apothecaries." "It is certain that the present condition of the United States Pharmacopœia is one of great prosperity. The book itself ranks with the best of its predecessors or of foreign Pharmacopœias, representing all that was possible in 1890. Its hold upon the people of the United

States is more firm than it has ever been before. Its sales have far exceeded those of any previous edition."

A notable feature of the work of this convention was the adoption of a new Constitution and By-Laws, and an entire reorganization of its work, whereby the Committee of Revision is relieved of all duties of a mere business nature, such as contracts, financial transactions, etc., its duties being confined to the preparation of the manuscript of the revised edition in conformity with the rules hitherto prevailing and under those laid down for their guidance by the convention. The business and finances of the convention are submitted to a Board of Trustees, the officers of the convention, the Committee of Revision and the Board of Trustees being the following:

Officers of the Convention.—President, Dr. Horatio C. Wood, of Philadelphia; Vice-Presidents, Prof. A. B. Prescott, of Ann Arbor, Mich., Prof. O. A. Wall, of St. Louis, Dr. R. W. Wilcox, of New York, Dr. N. S. Davis, Jr., of Chicago, and Dr. A. L. Lengfelt, of San Francisco; Secretary, Prof. H. M. Whelpley, of St. Louis; Assistant Secretary, Dr. M. G. Motter, of Washington, D. C.; Treasurer, Dr. William Mew, of Washington, D. C.

Board of Trustees.—A. E. Ebert, of Chicago, S. A. D. Sheppard, of Boston, William S. Thompson, of Washington, D. C., Charles E. Dohme, of Baltimore, Dr. George W. Sloan, of Indianapolis.

Committee of Revision of the U. S. P. 1900.—Charles Rice, New York City; E. H. Squibb, Brooklyn, N. Y.; J. P. Remington, Philadelphia, Pa.; L. E. Sayre, Lawrence, Kan.; Willis G. Gregory, Buffalo, N. Y.; N. S. Davis, Jr., Chicago, Ill.; James M. Good, St. Louis, Mo.; George F. Payne, Atlanta, Ga.; Edward Kremers, Madison, Wis.; S. P. Sadtler, Philadelphia, Pa.; Henry Kraemer, Philadelphia, Pa.; H. A. Hare, Philadelphia, Pa.; Chas. Caspari, Jr., Baltimore, Md.; A. B. Stevens, Ann Arbor, Mich.; A. B. Lyons, Detroit, Mich.; C. Lewis Diehl, Louisville, Ky.; Oscar Oldberg, Chicago, Ill.; John Marshall, Philadelphia, Pa.; Walter S. Haines, of Chicago, Ill.; J. J. Abel, Baltimore, Md.; Virgil F. Coblentz, New York City; Wilbur L. Scoville, Boston, Mass.; Carl S. N. Hallberg, Chicago, Ill.; A. R. L. Dohme, Baltimore, Md.; R. W. Wilcox, New York City.

But what interests us most in the outcome of this convention are the final instruction and definition of the

PRINCIPLES TO GOVERN THE REVISION

of the U. S. P. of 1890, and to note in how far and in what respect these have been forecast by the criticisms and discussions given in the preceding, and particularly by the honored Chairman of the Committee of Revision. These, as finally adopted, are the following:

SCOPE OF THE PHARMACOPŒIA.

The Committee of Revision is authorized to admit into the Pharma-

copœia any product of nature of known origin; also any synthetized product of definite composition which is in common use by the medical profession, the identity, purity, or strength of which can be determined. No compound or mixture shall be introduced if the composition or mode of manufacture thereof be kept secret, or if it be controlled by unlimited proprietary or patent rights.

DOSES.

After each pharmacopœial article (drug, chemical, or preparation) which is used or likely to be used internally or hypodermically, the Committee is instructed to state the average approximate (but neither a minimum nor a maximum) dose for adults, and, where deemed advisable, also for children. It is to be distinctly understood that neither this Convention nor the Committee of Revision created by it intends to have these doses regarded as obligatory on the physician, or as forbidding him to exceed them whenever, in his judgment, this seems advisable. The Committee is directed to make a distinct declaration to this effect in some prominent place in the new Pharmacopœia, the metric system to be used and the equivalents to be given, parenthetically in customary weights and measures, in approximate equivalents.

NOMENCLATURE.

It is recommended that changes in the titles of articles at present official be made only for the purpose of insuring greater accuracy, or safety in dispensing. In the case of newly admitted articles, it is recommended that such titles be chosen as are in harmony with general usage and convenient for prescribing; but in the case of chemicals of a definite composition a scientific name should be given at least as a synonym.

ASSAY PROCESSES.

The Committee is instructed to append assay processes to as many of the potent drugs and preparations made therefrom as may be found possible, provided that the processes of assay are reasonably simple (both as to methods and apparatus required) and lead to fairly uniform results in different hands. As regards the products of such assays, tests of identity and purity should be added wherever feasible. Physiological tests for determining strength should not be introduced by the Committee.

PURITY AND STRENGTH OF PHARMACOPŒIAL ARTICLES.

The Committee is instructed to revise as carefully as possible the limits of purity and strength of the pharmacopœial chemicals and preparations for which limiting tests are given. While no concession should be made towards a diminution of medicinal value, allowance should be made for unavoidable, innocuous impurities or variations due to the particular source or mode of preparation, or to the keeping qualities of the several articles.

In the case of natural products, the limits of admissible impurities should be placed high enough to exclude any that would not be accepted by other countries.

Regarding the strength of diluted acids, tinctures, and galenical preparations in general, it is recommended that the Committee keep in view the desirability of at least a gradual approach upon mutual concessions towards uniformity with similar preparations of other pharmacopœias, particularly in the case of potent remedies which are in general use among civilized nations.

GENERAL FORMULAS.

It is recommended that general formulas be introduced, as far as the particular nature of the several drugs will permit, for fluid extracts, tinctures, and such other preparations as are made by identical processes, and that the general formula to be followed in each case be merely indicated by reference.

WEIGHTS AND MEASURES.

The Committee is instructed to retain the metric system of weights and measures adopted in the seventh decennial revision.

PRECEDENTS.

In all matters not specially provided for in these "General Principles," the rules established for previous revisions, if there are any, should be followed.

SUPPLEMENTS.

The Committee of Revision is authorized to prepare a supplement whenever such action may be deemed desirable or practicable.

Proceedings of the State Pharmaceutical Associations.

(During the Year 1899.)

In the following, brief mention is made of the meetings held by the different State Pharmaceutical Associations, the dates during which they were in session, the names of the principal officers, and the titles of the papers and important reports that were read and discussed. As in the experience of the past, reports have reached the hands of the reporter only from about one-half of the State Associations, and from these all the papers that are useful in connection with the report have been abstracted and will be found under their proper headings. Such information as could be obtained in the current pharmaceutical press concerning the meetings of Associations from which no reports were received has in this instance also been noted, and these are indicated by prefix "(?)," as are also the names of the Associations, given in alphabetical order, from which no information whatever could be gathered. This has been done for the two-fold

purpose of calling the attention of the officers of the delinquent Associations to the fact that no report has been received from them, and to record in these Proceedings a complete list of the Pharmaceutical Associations of our country.

Alabama. — The Eighteenth Annual Meeting of the Alabama Pharmaceutical Association was held at Birmingham, May 9 and 10, 1899, in 3 sessions. Philip C. Candidus, of Mobile, was elected President; L. Stanton Brigham, of Montgomery, Secretary. The following papers were read:

"Mere Sparks," by F. H. Bancroft.

"French Pharmacy in New Orleans," by W. B. Parker.

"Petroleum in Pharmacy," by L. S. Brigham.

(?) *Arkansas*—.No information received.

(?) *Colorado.*—No information received.

(?) *Connecticut.*—The Twenty-third Annual Meeting of the Connecticut Pharmaceutical Association was held at Bridgeport, June 13 and 14, 1899. Charles F. Williams, of Thomastown, was elected President; Charles A. Rapelye, of Hartford, Secretary.

(?) *Delaware.*—The Thirteenth Annual Meeting of the Delaware Pharmaceutical Association was held at Wilmington, May 4, 1899. R. W. Cannon, of Bridgewell, was elected President; F. W. Fenn, of ———, Secretary.

(?) *Florida.*—No information received.

Georgia. — The Twenty-third Annual Meeting of the Georgia Pharmaceutical Association was held at Warm Springs, June 13 and 14, 1899, in 3 sessions. Ralph O. Howard, of Columbus, was elected President; Campbell T. King, of Macon, Secretary. The following papers were read:

"Yuca Filamentosa," by Max Morris.

"What is the Best Solvent in Preparing Official Resins?" by Henry R. Slack.

"Is the Pharmacist of the Future to be a mere Shop-keeper or a Skilled Member of the Profession?" two papers, by Chas. D. Jordan and by S. C. Parsons.

"A Higher Standard of Educational Attainment Should be Required of Our Apprentices," by J. J. Wooten.

"To What Extent is Methyl Alcohol used in the Preparation of Distilled Extract of Witch Hazel?" by R. O. Howard.

"On Trade Interests," by C. M. Crosby.

Interesting Committee Reports:

"On the Advancement of the Status of Pharmacists in the Service of the Government."

"On Samples of Drugs Examined for Adulteration by the Georgia Board of Pharmacy."

"On Adulterations."

Illinois.—The Twentieth Annual Meeting of the Illinois Pharmaceutical Association was held at Danville, June 7 and 8, 1899, in 3 sessions. Fred M. Schmidt, of Chicago, was elected President: R. N. Dodds, of Springfield, Secretary.

The following papers were read:

"An Examination of Some Commercial Pharmaceuticals," by David L. Davoll, Jr.

"Concerning the Differentiation of Animal and Vegetable Matter in Potable Water and in Sewage," by D. L. Davoll, Jr., R. T. Eaton, and A. C. Koch.

"A Process for the Assay of Spirit of Ethyl Nitrite," by David L. Davoll, Jr.

"Think of These Things," by L. C. Deck.

Interesting Committee Reports:

"On Legislation."

"On United States Pharmacopœia."

"On Trade Interests."

"On Apprenticeship and Education."

Indiana.—The Eighteenth Annual meeting of the Indiana Pharmaceutical Association was held at Indianapolis, February 9 and 10, 1899, in three sessions. T. D. Warner, of New Carlisle, was elected President; A. Timberlake, of Indianapolis, Secretary.

The following papers were read:

"On Emulsions," by C. W. Scott.

"Our State Board Examinations," by Prof. A. L. Green.

Interesting Committee Reports:

"On Legislation."

(?) *Indian Territory.*—The —— annual meeting of the Indian Territory Pharmaceutical Association was held at Vinita, May 26, 1899. J. R. Sheehon, of Vinita, was elected President; E. P. White, of Claymore, Secretary.

Iowa.—The Twentieth Annual Meeting of the Iowa Pharmaceutical Association was held at Clear Lake, July 17, 18 and 19, 1899, in three sessions. John H. Pickett, of Oskaloosa, was elected President; Fletcher Howard, of Des Moines, Secretary.

The following papers were read:

"Side Lines for Druggists," by Carrie S. Collins.

"The Woman Pharmacist—Elements of Success," by Annie L. Wood.

"Co-operative Manufacture by Retail Pharmacists," by F. J. Gressler.

Interesting Committee Reports:

"On Trade Interests."

"On Adulterations."

Kansas.—The Twentieth Annual Meeting of the Kansas Pharmaceutical Association was held at Lawrence, May 23 and 24, 1899, in two ses-

sions. R. F. Bryant, of Lincoln, was elected President; F. A. Snow, of Topeka, Secretary.

The following papers were read:

"Notes by an American Druggist in England," by T. Stevens.

"Comments Upon Some Vegetable Drugs Asked to be Dismissed from the Pharmacopœia," by G. L. Waldo and L. E. Sayre.

"Conversion of Calomel into Corrosive Sublimate," by Olive St. Clair Lewis.

Interesting Committee Reports:

"On Pharmacy and New Remedies."

Kentucky.—The Twenty-Second Annual Meeting of the Kentucky Pharmaceutical Association was held at Chameleon Springs, June 20 and 21, 1899, in 3 sessions. John J. Reynolds, of Flemingsburg, was elected President; J. W. Gayle, of Frankfort, Secretary. The following papers were read:

"Commercial Pharmacy," by Henry A. Fabra.

"How to Build up a Profitable Cigar Business," by E. G. Isaacs.

"The Druggist's Burden," by Addison Dimmitt.

"Drug Store Rules," by Addison Dimmitt.

"How to Run a Drug Store Successfully in a Town or City of More than Ten Thousand Inhabitants," by Addison Dimmitt.

"How to 'Run' a Drug Store in Towns of Ten Thousand or Less," by Vernon Driskell.

Interesting Committee Reports:

"On Papers and Queries."

(?) *Louisiana.*—The Seventeenth Annual Meeting of the Louisiana Pharmaceutical Association was held at New Orleans, May 10 and 17, 1899. Wm. M. Levy, of New Orleans, was elected President; W. P. Duplantes, of New Orleans, Recording Secretary.

Maine.—The Thirty-Second Annual Meeting of the Maine Pharmaceutical Association was held at Portland, July 6 and 7, 1899, in two sessions. A. M. Robinson, of Bangor, was elected President; M. L. Porter, of Danforth, Secretary. The following papers were read:

"The Pressing Present Need," by W. F. Jackman.

"What Standard of Knowledge of the Pharmacopœia Should be Held Necessary for Registration in Pharmacy?" by Ernest Jordan.

"Abstract of Special Investigation in the Laboratory of the Department of Pharmacy, University of Maine, 1899."

"Notes on Some of the Questions Proposed to Competitors for Prizes in 1899," by H. T. Cummings.

"The Relation of the Physician to his Co-worker," by T. J. Stevens.

"The Cultivation and Collection of Opium," by E. T. Bowers.

"Some Thoughts on Beginning the Study of Pharmacy."

Interesting Committee Reports:

"On Pharmacy."

"On Drug Market and Trade Interests."

Maryland.—The Seventeenth Annual Meeting of the Maryland Pharmaceutical Association was held at Ocean City, July 11 to 15, 1899, in six sessions. Alfred R. L. Dohme, of Baltimore, was elected President; Charles H. Ware, of Baltimore, Secretary. The following papers were read:

"Yellow and Green Iodides of Mercury," by J. F. Hancock.

"Tablet Triturates," by Chas. Schmidt.

"Adulterations of Oils," by A. R. L. Dohme.

"Glycerin," by Chas. Caspari, Jr.

"The Metric System Compared to Other Weights and Measures," by Chas. H. Ware.

"Synthetic Oil of Wintergreen," by A. R. L. Dohme and H. Engelhardt.

"Salicylic Acid in Eye Waters," by Robt. S. McKinney.

"Comments on Belladonna Plaster," by Chas. Caspari, Jr.

"Homatropine Intoxication or Substitution, which?" with "Reply," by Chas. H. Ware, and "Letters," by C. L. Meyer and by Merck & Co.

"Is the Rebate System a Success?" by A. J. Corning.

"Artificial Benzoic Acid," by Wm. C. Powell.

"Lily of the Valley," by Aug. Schrader.

"Assays of Belladonna, Henbane and Digitalis Leaves," by A. R. L. Dohme and H. Engelhardt.

Interesting Committee Reports:

"On Pharmacy."

"On Adulterations."

Massachusetts.—The Eighteenth Annual Meeting of the Massachusetts State Pharmaceutical Association was held at Holyoke, June 13, 14 and 15, 1899, in five sessions. Wm. D. Wheeler, of Boston, was elected President; James F. Guerin, of Worcester, Permanent Secretary. The following papers were read:

"Pharmaceutical Notes," by Wilbur L. Scoville.

"Notes from the Analytical Laboratory of the Mass. College of Pharmacy," by J. W. Baird.

"Commercial Volumetric Indicators," by F. H. Knight.

Interesting Committee Reports:

"On Adulterations and Sophistications."

Michigan.—The Seventeenth Annual Meeting of the Michigan State Pharmaceutical Association was held at Jackson, August 15, 16 and 17, 1899, in 4 sessions. Ottmar Eberbach, of Ann Arbor, was elected President; Charles F. Mann, of Detroit, Secretary. The following papers were read:

"Organization," by Samuel Kidder, Jr.

Interesting Committee Reports:

"On Mutual Manufacturing."

"On Legislation."

(?) *Minnesota.*—The Fifteenth Annual Meeting of the Minnesota State Pharmaceutical Association was held at the Lake Park Hotel, Lake Minnetonka, June 20 and 21, 1900.

Missouri.—The Twenty-first Annual Meeting of the Missouri Pharmaceutical Association was held at Jefferson City, June 6, 7, 8 and 9, 1899, in 4 sessions. H. M. Pettit, of Carrollton, was elected President; H. M. Whelpley, of St. Louis, Secretary. The following papers were read:

"Does it Pay the Pharmacist to Make Compressed Tablets?" by Ambrose Mueller.

"The Prescription Scale and Quantitative Chemical Work of the Druggist," by Carl G. Hinrichs.

"Women in Pharmacy," by Frederica de Weyl.

"Commercial Pharmacy," by O. F. Bausch.

"How to Make the Drug Business Pay," by Wm. Mittelbach.

"Financial Points for a Retail Druggist," by Otto F. Claus.

"Investigation of Two Samples of Glucose," by Constantine M. T. Klie.

"A Chemical Pharmacist, or Pharmacists' Chemicals," by J. F. Llewellyn.

"How to Secure the Family Trade for Spices and Flavoring," two papers, by Wm. Mittelbach and by G. H. J. Andreas.

"The Retail Druggist and the Coming Revision of the Pharmacopœia," by G. D. Hinrichs.

"A Few Suggestions to our Pharmacopœial Committee," by Francis Hemm.

"A Report on the Use of the Metric System in 380,000 Prescriptions," by H. M. Whelpley.

"Does Our Attorney-General Understand the Situation," by Francis Hemm.

"Retrospective Index of Contributions (to the Missouri Pharm. Assoc.)," by Ambrose Mueller.

Interesting Committee Reports:

"On National Formulary."

"On Pharmacopœia."

(?) *Montana.*—The ——— Annual Meeting of the Montana Pharmaceutical Association was held at Butte, August 8 and 9, 1899. D. M. Newbro, of Butte, was elected President; Sid. J. Coffee, of Missoula, Secretary. The following papers were read:

"Trade Interests," by E. E. Gallogly.

"Old Time Pharmacy," by C. B. Hoskins.

(?) *Nebraska.*—No information received.

New Hampshire.—The Twenty-sixth Annual Meeting of the New Hampshire Pharmaceutical Association was held at Sunapee Harbor, September 5 and 6, 1899, in three sessions. S. Howard Bell, of West Derry,

was elected President; Frank L. Way, of Manchester, Secretary. No papers on pharmaceutical topics were read at this meeting.

New Jersey.—The Twenty-ninth Annual Meeting of the New Jersey Pharmaceutical Association was held at Atlantic City, May 24 and 25, 1899, in three seesions. William C. Alpers, of Bayonne, was elected President; Frank C. Stutzler, of Elizabeth, Secretary. The following papers were read:

"What Can be Done to Reduce the Unreasonably Long Working Hours of the Pharmacist?" by E. A. Sayre.

"Should the Pharmaceutical Association Try to Restrict by Legislation the Dispensing of Medicines by Physicians?" by E. A. Sayre.

"What Advantages Would There be in Requiring a Better Education of Our Apprentices, and Should the Latter be Registered at the Time of Entering a Store?" by Henry Schmidt.

"The Pharmacopœia and Examinations," by William C. Alpers.

"Poor Lime Water," by Pierce B. Bear.

"On Lime Water," by George E. Thum.

"A History of Umbelliferous Plants," by P. E. Hornwell.

Interesting Committee Reports:

"On New Remedies."

"On Legislation."

(?) *New Mexico.*—No information received.

New York.—The Twenty-first Annual Meeting of the New York State Pharmaceutical Asnociation was held at Albany, June 27, 28, 29 and 30, 1899, in five sessions. William Muench, of Syracuse, was elected President; Judson B. Todd, of Ithaca, Secretary.

No papers on pharmaceutical topics were read at this meeting.

Interesting Committee Reports:

"On Legislation."

"On Adulteration."

"On Commercial Interests."

(?) *North Carolina.*—The Twentieth Annual Meeting of the North Carolina Pharmaceutical Association was held at Durham, May 18 and 19, 1899. J. B. Smith, of Lexington, was elected Presideut; P. W. Vaughan, of Durham, Secretary.

North Dakota.—The Fourteenth Annual Meeting of the North Dakota State Pharmaceutical Association was held at Fargo, August 8, 9 and 10, 1899, in 3 sessions. A. S. Lien, of Hillsboro, was elected President; W. S. Parker, of Lisbon, Secretary and Treasurer. The only paper presented on pharmaceutical topics was in the form of a report:

"On Labels and Formulas."

Ohio.—The Twenty-first Annual Meeting of the Ohio State Pharmaceutical Association was held at Put-in-Bay, June 22, 23 and 24, 1899, in 4 sessions. Alfred DeLang, of Cincinnati, was elected President; Lewis C.

Hopp, of Cleveland, Permanent Secretary. The following papers were read:

"Registration of Poisons," by Theo. D. Wetterstroem.

"Cod Liver Oil Emulsions," by H. V. Arny.

"Manufacture of Spiritus Aetheris Nitrosi and Preliminary Notes on a New Process," by Joseph Feil.

Interesting Committee Reports:

"On Trade Interests."

"On Pharmacy Laws."

Oklahoma.—The Ninth Annual Meeting of the Oklahoma Pharmaceutical Association was held at Oklahoma City, April 5 and 6, 1899, in 2 sessions. W. R. McGeorge, of Stillwater, was elected President; F. M. Weaver, of Oklahoma City, Secretary. The following papers were read:

"Our Relationship to the Physician," by A. E. Gray.

"Pharmacy, Ancient and Modern," by Chas. A. Dow.

"What Shall We do with Our Girls?" by R. S. Reynolds.

"Some Fatty Aromatic Alcohols," by Frank J. Briggs.

(?) *Oregon.*—No information received.

Pennsylvania.—The Twenty-second Annual Meeting of the Pennsylvania Pharmaceutical Association was held at Philadelphia, June 13 and 14, 1899, in five sessions. Charles L. Boyd, of Butler, was elected President; Jacob A. Miller, of Harrisburg, Secretary. The following papers were read:

"How Far Can 'Columbian Spirit' Replace Alcohol in Manufacturing by the Pharmacist?" by D. J. Thomas.

"The Modern Pharmacist," by John F. Patton.

"Artificial Foods, Why They Exist, and What They Are," by J. Percy Remington.

"Odor in Recognition of Drugs," by C. B. Lowe.

"Assay of Belladonna Leaves," by Frank X. Moerk.

"The Humorous Side of Business," by J. H. Redsecker.

"Some Notes on Chondrus," by Henry Kraemer.

"Some Recent Adulterations," by Lyman F. Kebler.

"Estimation of Codeine," by H. C. C. Maisch.

"Laboratory Notes," by Charles H. La Wall.

"Fat-Free Tincture of Digitalis," by Joseph W. England.

"Is the Demand for Tablet Triturates on the Decline?" by D. J. Thomas.

"Some Partially Unexplored Fields for Occupation of the Idle Hours of the Pharmacist," by F. W. E. Stedem.

"Sub-Gallate of Bismuth," by Lyman F. Kebler.

Interesting Committee Reports:

"On Legislation."

"On Trade Interests."

"On Adulteration."

(?) *Rhode Island.*—No information received.

South Carolina.—The Twenty-Third Annual Meeting of the Pharmaceutical Association of the State of South Carolina was held at Charleston, May 11 and 12, 1899, in two sessions. Peter Robertson, of Newberry, was elected President; J. A. Barbot, of Charleston, Secretary. Routine business only appears to have been transacted at this meeting.

South Dakota.—The Fourteenth Annual Meeting of the South Dakota State Pharmaceutical Association was held at Watertown, August 8, 9 and 10, 1899, in two sessions. D. F. Jones, of Watertown, was elected President; E. C. Bent, of Dell Rapids, Secretary. The following papers were read:

"Wayside Impressions in Pharmacy and Regulation of Practice in South Dakota," by I. A. Keith.

"Relation of the College of Pharmacy to the Profession," by R. T. Whitehead.

"Difficulty to Maintain Pharmacy as a Profession," by W. L. Faust.

Interesting Committee Reports:

"On Trade Interests."

Tennessee.—The Fourteenth Annual Meeting of the Tennessee State Druggists' Association was held at Jackson, July 19 and 20, 1899, in four sessions. J. L. Nelson, of Jackson, was elected President; R. W. Vickers, of Murfreesboro, Secretary. The following papers were read:

"The Future Pharmacist," by G. C. Childress.

"Has the Pharmacist a Right to Substitute? If so, Under What Circumstances," by J. L. Nelson.

"Should We Have a Law Restricting the Sale of Morphine, Cocaine, etc.?" by C. R. Sizmore.

Interesting Committee Reports:

"On Legislation."

(?) *Texas.*—The Twentieth Annual Meeting of the Texas Pharmaceutical Association was held at Waco, May 16, 17 and 18, 1899. James L. Hazlett, of Hearne, was elected President: R. H. Walker, of Gonzales, Secretary and Treasurer.

(?) *Utah.*—No information received.

Vermont.—The Sixth Annual Meeting of the Vermont State Pharmaceutical Association was held at St. Albans, October 25 and 26, 1889, in two sessions. L. B. Hopkins, of Brandon, was elected President; Wilfred F. Root, of Brattleboro, Secretary. The following paper was read:

"On Opium," by J. C. F. With.

Interesting Committee Report:

"On Legislation."

Virginia.—The Eighteenth Annual Meeting of the Virginia Pharmaceutical Association was held at Natural Bridge, July 18, 19, and 20, 1899,

in six sessions. A. W. Eley, of Suffolk, was elected President; C. B. Fleet, of Lynchburg, Secretary. No papers on pharmaceutical topics of exceptional interest were presented.

Interesting Committee Report:

"On Adulteration."

(?) *Washington.*—The Tenth Annual Meeting of the Washington State Pharmaceutical Association was held at New Whatcom, July 12 and 13, 1899. Walter St. John was elected President; W. P. Bonney, Secretary. The following papers were read:

"Pharmacy, Yesterday, To-day, To-morrow," by Miss Alice Summers.

"Competition, Trusts, and Associations," by Dr. Bollink.

"Objects of the Pharmaceutical Association," by F. J. Fitz.

"Our Credit System," by Dwight Darling.

"Pharmacy Legislation," by P. Jennes.

Wisconsin.—The Nineteenth Annual Meeting of the Wisconsin Pharmaceutical Association was held at Janesville, August 8, 9 and 10, 1899, in six sessions. C. A. Spencer, of Waupaca, was elected President; Henry Rollmann, of Clinton, Secretary. The following papers were read:

"Relations of Physicians to Pharmacists and Different Ways to Harmonize Their Interests," by Geo. Sonntag.

"Should Formalin (or Formaldehyde) Ever be Used as a Preservative in Medicinal Preparations? If so, to What Extent?" by W. P. Clark.

"Adulteration of Drugs," by Ed. Huber.

"Prescription Notes," by Herman L. Emmerich.

"Our Relations as Jobbers and Retailers," by L. A. Lang.

"Forward! is the Motto of Our State, the Watchword of Its People," by Herman L. Emmerich.

PHARMACY.

A. Apparatus and Manipulations.

Weights, Measures, Specific Gravity.

Metric Weights and Measures—Indifference of the Average Medical Practitioner to their Use.—By way of introductory to an interesting paper, in which a concise history of the introduction of metric weights and measures and a review of its advantages as compared with other systems of weights and measures is given, Charles H. Ware calls attention to Dr. Whelpley's efforts to ascertain the extent to which the metric system isused in prescriptions, and mentions that he has himself made endeavors in a similar direction. Replies received from prominent druggists to a large number

of requests for information concerning the use of the metric system by physicians in various large cities convince him that not one physician out of a thousand uses this admirable system.—Proc. Maryland Pharm. Assoc., 1899, 93–97.

Metric Weights and Measures—Extent of Use in Prescriptions in the United States.—In continuation of his previous efforts in the same direction, Dr. H. M. Whelpley has received reports from 380 pharmacists in 39 different States and Territories, covering in each case the last 1,000 prescriptions on file, and giving the extent to which the metric system is used in prescriptions. In two States the percentage was slightly in excess of 20 per cent.; in one, 17.80 per cent.; in two, 10.80 and 13.30 per cent.; in six, from 5 to 10 per cent.; in fourteen, from 1 to 4 per cent.; in two between 0.5 and 1 per cent.; and in twelve, less than 0.5 per cent. of the total number of prescriptions filled in the respective localities. Including the above, Dr. Whelpley has reported during the past three years on 830,000 prescriptions, which show an average of *5.29* per cent., and therefore some slight progress has been made during the past year, which shows *5.42* per cent. of prescriptions written in metric terms.—Proc. Missouri Pharm. Assoc., 1899, 61.

Russian Weights and Measures—New Regulation of Standard.—According to a recent official promulgation the standards of weights and measures in Russia have been fixed as follows: The *pound* is declared to be equal to 409.512 Gm., a *pail* or *vedro* is to hold thirty pounds of distilled water at 16⅔° (Celsius), and a *garnietz* eight pounds of water. The unit of length is the *arshin*, equal to 71.12 centimeters. The metric system is to be optional, and may be used on a par with the Russian in commerce in dealing with contracts, accounts, etc., and after mutual agreement by State and municipal authorities. Private persons, however, are to be under no compulsion to use the metric system when dealing with the above-named authorities.—Pharm. Journ., Aug. 26, 1899, 211.

Gravimetroscope—A Convenient Chemical Balance—A. Gawaloski has devised an instrument which serves the purpose of a chemical balance and of a specific gravity apparatus, and which is particularly useful in cases in which the instruments in common use are obtainable or transportable with difficulty. This "gravimetroscope" is shown, together with some of its parts in detail by Figs. 1, 2, 3 and 4, and may be briefly described as follows: The large-bulbed but short-stemmed hydrometer, *A*, provided with a thermometer *F*, in the interior of the bulb and weighted as shown at *G*, is immersed in a short but wide cylinder, *H*, containing water or any other suitable non-volatile and moderately viscous liquid, such as chloride of calcium solution, paraffin oil, glycerin, etc. The scale *B*, affixed in the interior of the stem, is adjusted in grammes and its subdivisions to the particular liquid selected and at a fixed temperature (say 18° C.), so that on immersion in its completed form, with the scale pan *E* adjusted, but not

weighted, the zero (0) of the scale shall float on a line horizontal with the surface of the liquid. These divisions of the scale extend both upward and downward from the zero, the figures in the lower being preferably in white on a black ground, while the figures above 0 are black on white ground, as shown by Fig. 3. Obviously the instrument will sink deeper in

FIG. 1.

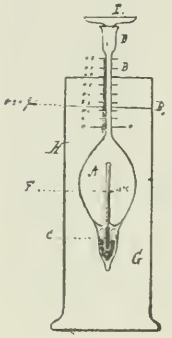


FIG. 2.

FIG. 3.

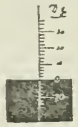
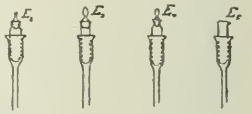


FIG. 4.



Gravimetroscope.

the scale at temperatures higher than that at which the scale has been adjusted, and float higher if the liquid is cold. The correction is made by subtracting the differnnce between the point of immersion and the zero in the first case, or by adding the difference in the case of colder liquid. As will be noted, the stem of the gravimetroscope is enlarged at *D* for the reception of the scale pan *E* (Fig. 2), or the receiving vessels E_2—E_5, which may be constructed of glass or platinum, but must all be of identical weight. These are intended for the reception of varying substances to be weighed, their selection depending on the nature of them—such as volatile, hygroscopic, fuming or powdery substances, filters, etc. The application of the instrument as a hydrometer is obvious; but its most important use is that of a convenient balance, which is easily transported, and is accurate for all weighings from a half centigram upwards.—Pharm. Post, July 2, 1899, 367–368.

Prescription Balance — Efficiency in Pharmacopœial Testing. — Carl G. Hinrichs observes that the druggist being held responsible for the purity and strength of his goods by the specifications of the Pharmacopœia, it is essential that he should be able to satisfy himself, by his own personal work, and by the means at his hands, of the proper qualities of the preparations in stock. The Pharmacopœia throughout implies the use of the analytical balance, a costly instrument, requiring special skill of management and great length of time for each operation. By an extended series of determinations carried out during the last two years, examples of which are given in the present paper, the author has satisfied himself that any

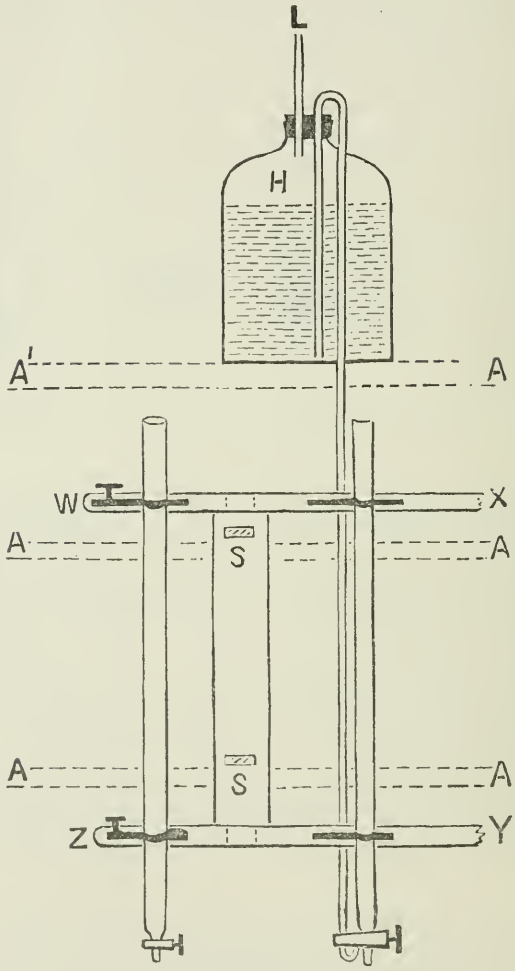
ordinary (good, Rep.) prescription balance, even without protecting glass case, is perfectly sufficient for all practical work demanded by the Pharmacopœia in the way of volumetric testing. — Proc. Missouri Pharm. Assoc., 1899, 42–44.

Specific Gravity—Difficulty of Determination at the Official Temperature.—Geo. F. Payne calls attention to the difficulties encountered in making determinations of specific gravities and solubilities, and to do volumetric analysis at the standard temperature of 15° C. of the U. S. P., which he considers peculiarly unsuited for either rapid or accurate work. It is true that the nearly corresponding standards, 59° and 60° F., have long been used in the scientific world, and that many determinations have been made at these two temperatures. But so many precautions have to be observed, and there are so many difficulties in the way of obtaining and maintaining these temperatures under process, that it would seem to be incumbent on the revisers of the U. S. P. to entertain any suggestion made favoring the adoption of a more practical and convenient standard of temperature that shall secure accuracy in taking specific gravities under the ordinary conditions surrounding pharmacists and chemists. Such, in the author's opinion, is the temperature of 37° C. This temperature is one which is not exceeded in the air of the laboratory, and if used as a standard, never necessitates cooling a liquid which is at the temperature of the atmosphere. Only a slight degree of heat will usually be needed to bring the liquid to the standard, a rise of 7° C. above the yearly average temperature of the laboratory (30° C.) being easy to obtain, while a reduction in the temperature of liquid of 15° C. below the yearly average is inconvenient to secure and also to maintain. It is true that a few tables will have to be changed, or figured over to fit this practical standard, but the great convenience and ease with which a high degree of accuracy can be secured under ordinary conditions, without laborious calculations, and the elimination of the annoyance of being compelled to use ice, cooling mixtures or volatile liquids, should cause the adoption of this natural standard of 37° C. in the United States Pharmacopœia.—Drugg. Circ., May, 1900, 97.

Burette Rack—Convenient Construction—C. Sordes Ellis has designed and used with advantage the burette rack shown by the accompanying diagram (Fig. 5). *W X* and *Y Z* are two strips of wood, one inch by two inches and five feet long, with narrow edges to the front, held together at a distance of eighteen inches apart by three pieces of wood (only one shows) *S S*, mortised into the long strips—the dotted lines *A A A A* being two shelves firmly fixed to the wall. To these shelves six strips of wood are screwed and mortised into the uprights *S S*, two of the mortises being shown. At convenient distances apart semicircular notches are cut in the front of the frame, both top and bottom, in a perpendicular line, for the reception of the burettes, as shown at *G*, Fig. 6, in which the details of

the clip are also given. This is made of $\frac{1}{16}$ inch brass, ½ or ⅝ inch wide. A square, *K*, is hinged at *B* to a longer piece, having a slight de-

Fig. 5.

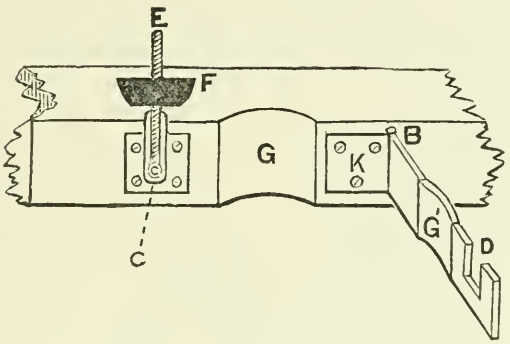


Burette Rack.

pression at *G'* and a slit at *D*. On the other side of *G* is another square brass, with a slotted projection brazed on the back. A piece of brass rodding, *E*, is hinged below, at *C*, so as to move forward, and has a thread cut on it which fits a nut, *F*, having a milled edge. *G* and *G'* are both lined with thick baize or swans'-down cloth. When closed, the rod *E* drops into the slot *D*, and, on screwing it up tight with the nut *F*, the burette is held firmly in place. A rack of the given dimensions will accomo-

date six burettes. When large quantities of standard solutions are in constant use, these may be supplied direct from containers placed on a

Fig. 6.

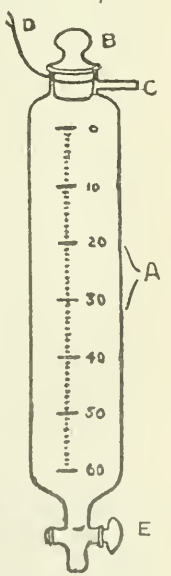


Section of Burette Rack.

shelf into burettes provided with a two-way tap. This arrangement is shown in the diagram at *A' A'*, *H* and *L*.—Chem. News, Jan. 19, 1900, 29.

Weighable Burette—Advantage.—E. Saville Peck describes the "weight burette," shown by Fig. 7, which, as its name implies, is simply a burette which can be weighed before and after titration, giving the weight of solution used instead of the volume, and being made from directions given by C. T. Heycock. The essential parts are: *A*, an ordinary glass cylinder, of about 70 Cc. capacity, which may or may not be provided with a scale in cubic centimeters. *B*, a hollow stopper with a small perforation opposite *C*, which is a glass tube used to admit air when withdrawing the solution. *D*, a wire loop for suspending the burette upon the hook above the balance-pan. *E*, an ordinary glass stop-cock. Among the advantages claimed are avoidance of error by change in volume due to temperature change, or such arising from inaccurate calibration, or errors in reading, etc. The instrument has been used with advantage in Sidney College Laboratory, Cambridge, where determinations of great accuracy have been required, and although it takes longer than when ordinary burettes are used, the accuracy and uniformity of the results obtained fully justifies the extra expenditure of time and trouble. Specific directions for preparing the standard weight solutions for commercial use with this form of burette are given, but must be referred to in the original paper.—Trans. Brit. Pharm. Conf., 1899, 425–427.

Fig. 7.

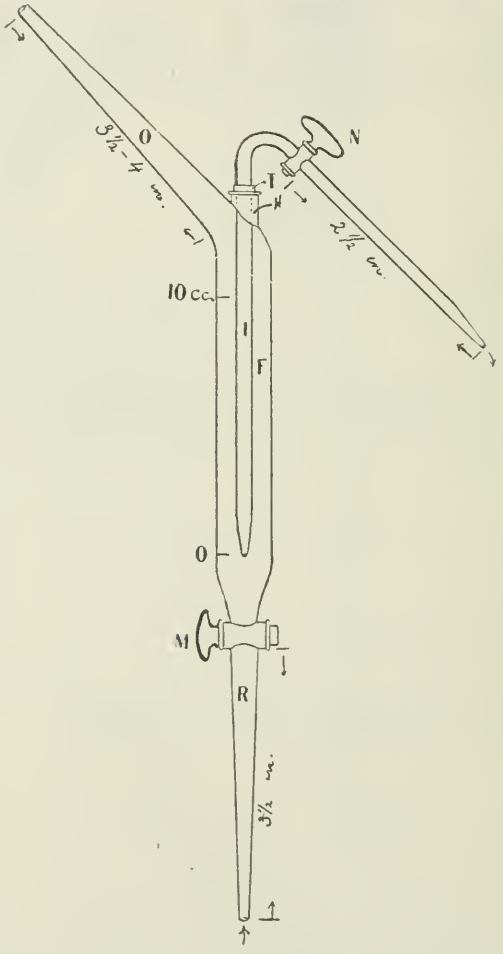


Weight Burette.

Pipette—Improved Construction for Convenience, Rapidity and Accuracy.

—John W. Forbing has devised the pipette shown in the accompanying drawing (Fig. 8), which possesses many advantages over pipettes of ordinary construction, and is particularly adapted where corrosive or poisonous liquids are to be handled, as well as in urine and milk analyses, &c. It consists of a glass cylinder, *F*, bent at the top at an angle of 45° to form the mouth-piece *O*. A neck, *H*, is sealed into the upper part of

Fig. 8.



the cylinder and is provided with a perforated cork, *T*, through which passes the outlet tube, *I*. An inlet tube, *R*, and the stop-cocks, *N* and *M*, complete the apparatus. The pipette may be graduated as desired. By raising or lowering the tube *I*, any measured quantity of liquid may be blown off.—Merck's Rep., March, 1900, 104.

Official Medicine Dropper—Necessity to Secure Uniformity in Medication.—S. W. Williams discusses the well-known variations in the size of drops, which results not only when different fluids are dropped from the same container, but also when the same liquid is dropped from the same container under different conditions, such as variation in temperature, etc. In view of the uniformity in the strength of galenical preparations that is attainable by standardizing processes, and that doubtless will make rapid progress towards perfection in the products of the next Pharmacopœia, the demand seems to be warranted that some practical provision for more accurate dosage be made. It has been suggested by Dr. G. F. Payne that a dropper be constructed in the form of a graduated pipette, thus admitting of measurements in minims, drams, or cubic centimeters and tenths thereof. Mr. Williams suggests to the makers of medicine droppers that they determine the diameter and shape of orifice necessary to provide for dropping as nearly as possible sixty drops of water to a dram, and graduate the tube on one side to sixty minims—one dram—and the other to cubic centimeters and tenths thereof. This should provide for a fairly accurate means of measuring small doses, and, if instructions are given as to manner of holding and approximate rate of flow, a drop may come to have a far more definite meaning than it does at present. That is to say, a drop of a certain liquid would represent practically the same amount, wherever the standard dropper were employed. In other words, we should provide for a drop of tincture of digitalis, for example, always representing approximately the same quantity. Each liquid, however, should be considered by itself, or with others only when such preparations have been classified by actual experiment as belonging to what might be termed drop groups. No provision is here made for giving the drop a definite significance as applied to liquids generally, nor does this seem necessary. The idea is to provide for a drop, always meaning the same amount as applied to one particular liquid or group of liquids dropping in the same way. The physician, when prescribing tincture of nux vomica, for example, naturally cares only for its relation to quantities of this distinct preparation which he has found to give certain therapeutic results. It can matter little what relation the size of this drop bears to the size or weight of a drop, say, of Fowler's solution, which would be very different. In the author's opinion, U. S. P. standard measures would meet with the favor of physicians, and be recommended by them as desirable in every household. If such were the case, they would become articles of ready sale in the drug store, another point worth considering. A circular explaining the great variation in drops as delivered from bottles, stoppers or guiding rods of different shapes and sizes, would both interest and convince the average citizen that a set of official standard measures would be a good thing to have in the house.—Drugg. Circ., Oct., 1899, 220.

Drops — Proposed Pharmacopœial Definition. — The well-known varia-

tion in the size of drops, depending on the kind of fluid and the conditions under which it is dropped, has given rise to various suggestions made with the view to arriving at some definite standard for measuring them. The "Schweiz. Wschr. f. Chem. in Pharm." (1899, No. 40) now proposes for adoption into the Swiss Pharmacopœia the following definition: *One drop is the twenty-fifth (25) part of one cubic centimeter, and is to be measured in a graduated measuring glass.*

Automatic Medicine Measure and Stopper—A Useful and Simple Contrivance.—Under the name of "l' auto mesure," a simple contrivance has been introduced in France which permits the automatic measurement of medicinal doses—a tea- or tablespoonful—conveniently. The measure is shown inserted into an ordinary cork which serves as stopper for the medicine vial by Fig. 9, and in use by Fig. 10, which sufficiently explain its

Fig. 9. Fig. 10.

Automatic Medicine Measure and Stopper.

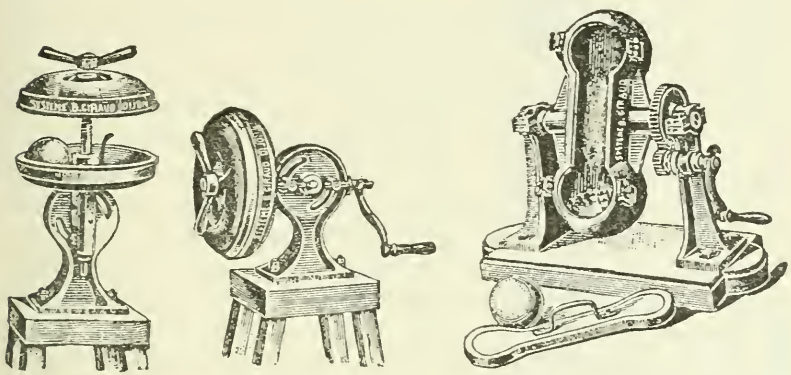
construction. It is filled by inclining the bottle stoppered with it, when upon removal and slight pressure upon the bottom surrounding it, air is admitted, and the contents may be emptied directly into the mouth, or into a glass provided for its reception.—Pharm. Post., Aug. 6, 1899, 429.

COMMINUTION.

Ball-Pulverizing Apparatus—Novel Forms.—Giraud constructs the pulverizing machines shown by Figs. 11, 12 and 13, intended for operations in the pharmaceutical laboratory. The first of these, designated as "Veloporphyre," consists of a heavy shallow pan fastened through its center to a stout rod, and closed by a second pan of the same size and shape which slides over the same rod. The latter is provided with a thread and thumb screw at its upper extremity for fastening down the accurately fitting upper pan after the introduction of a steel ball and the substance to be pulverized (Fig. 11). It is so attached to the stand that it may be turned at right angles, as shown by Fig. 12, in which position it may be rapidly revolved by means of the winch attached to the other ex-

tremity, the necessary speed being attained by a suitable arrangement of cog-wheels. The apparatus is particularly designed for reducing coarse to fine powders, or for mixing powders or salves, &c. For pulverizations in general the "Autopileur" (Fig. 13) is designed to replace the common mortar and pestle. It consists of a tubular vessel expanded at both extremities to globular shape and provided with a lid opening lengthwise

FIG. 11. FIG. 12. FIG. 13.



Ball-Pulverizing Apparatus.

for the introduction of the ball and drug. As shown in the cut, the cylinder is adjusted so that it may be revolved lengthwise with greater or less rapidity, the ball exerting both pounding and friction in its alternate descent from the one end to the other. Loss by dusting is avoided by felt-packing attached to the lid.—Pharm. Centralbl., Oct. 5, 1899, 610.

Rubber Mortar Cap—A Useful Device.—A very simple and practical device intended to serve as a cover for mortars during triturations, etc., is described by R. Scholl. It consists of a conical cap of sheet rubber, the center of which is perforated, so as to admit the handle of a pestle and permit its free movement when the cap is adjusted over the mortar and its contents, the bottom of the rubber cone being slightly constricted so as to fit tightly over the edges of the mortar.—Pharm. Rev., March, 1900, 133; from Chem. Ztg., *24*, 15.

FIG. 14.

Revolving Sieve.

Revolving Sieve—Practical Construction.—Giraud constructs a revolving drum sieve with changeable sieve bottom, which is illustrated by the accompanying cut (Fig. 14). It consists of a double drum,

composed of two sieves of like mesh, which are suitably fastened together after the powder is introduced. This secures a large sifting surface, while the continued revolution of the drum rapidly effects the passage of the powder through the meshes.—Pharm. Centralh., Oct. 5. 1899, 610.

Sieves—Convenient and Cheap Construction.—F. N. Strickland states that an extemporaneous and excellent sieve is quickly and easily made as follows: Lay a piece of bolting cloth over the top of a suitable-sized pill or powder box, and replace the cover; remove the top of the cover and the bottom of the box by cutting away with a knife. The bolting cloth will be found stretched tightly over the box and the sieve is complete. A convenient and more durable sieve is cheaply made by taking two round, empty drug cans, quinine cans, for instance, to a tinsmith, and having him make a band of tin 1½ inches deep, so that the ends of it will exactly fit into each of the drug cans. Inside one end of this middle section or tin band, solder copper or brass gauze of any desired mesh. It is better to have three such middle sections, each being a sieve of a different degree of fineness, to be used as occasion requires. To sift a powder, put a sieve of desired mesh into one can, and the powder into the other. Set the can containing the sieve down into the one containing the powder. Invert the can, and sift the powder through it into the lower one. No dust will escape, if all has been carefully fitted.—Drugg. Circ., June, 1900, 116.

SOLUTION, EXTRACTION, PERCOLATION.

Solubilities of Immiscible Liquids in Water.—W. Herz has determined the solubility of certain liquids, which are insoluble in water in a practical sense, and reciprocally the solubility of water in these liquids. The temperature at which solutions were effected was 22° C.

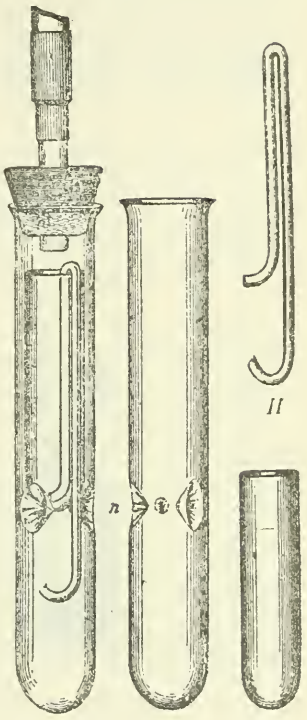
100 vol. water dissolve:		*Water dissolved by 100 vols. of*	
Chloroform	0.420	Chloroform	0.152
Carbon disulphide	0.174	Carbon disulphide	0.961
Ligroin	0.341	Ligroin	0.335
Ether	8.110	Ether	2.930
Benzol	0.082	Benzol	0.211
Amyl alcohol	3.284	Amyl alcohol	2.214
Aniline	3.481	Aniline	5.220

—Apoth. Ztg., Feb. 7, 1900, 89; per I. Soc. Ch. Ind.

Extraction Apparatus—Simple Construction for Small Operations.—W. Buttner describes a simple extraction apparatus, the parts of which may be readily made in the laboratory with little trouble, as shown by the accompanying cut (Fig. 15). A stout test-tube is heated in three places equally distant below the middle of the tube, and the heated parts pressed in by means of a stout, heated iron wire, thus giving it the shape and appearance of the tube *C* at *n*. An inner tube, *E*, is then cut from a smaller test-tube, of such dimensions that it may be readily inserted into the tube *C* and rest on the inner projections of the latter. A syphon,

H, is next made from a piece of glass tubing, giving it the form shown so as to permit of being easily slipped into the inner tube *E*; care being taken that the bend rests on the edge of the tube, but not extend above it, lest the automatic syphoning off of the liquid will be prevented. The apparatus is used as follows: The substance to be extracted is placed into the tube *E*, after the syphon has been put in place, the tube *E* is then inserted into the tube *C*, and the solvent poured into *E* until the latter is full, when, if the syphon has been properly made —its calibre not too constricted or too large—the liquid will syphon into *C*. The tube *E* is filled several times in this way, to insure a sufficient solvent; after which a cork bearing a small reflux condenser is inserted into the mouth of *C*, and heat is applied either directly or by a suitable bath. —Merck's Rep., Feb., 1900, 72; from Pharm. Centralh. XL (1899), 781.

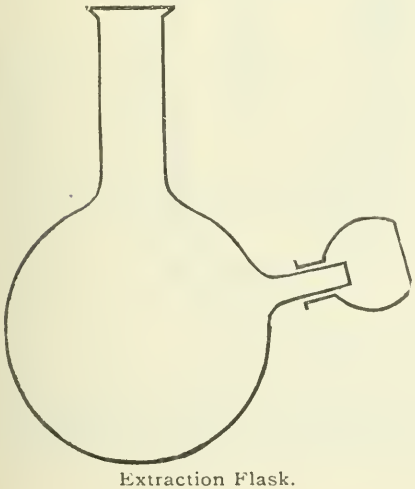
FIG. 15.



Extraction Apparatus.

Extraction Flask—Attachment for Weighing Final Contents.—Fred. A. Anderson has devised the extraction flask shown by Fig. 16, by means of which he avoids the difficulty of weighing small residues of extractions in large flask and secures greater accuracy.

FIG. 16.



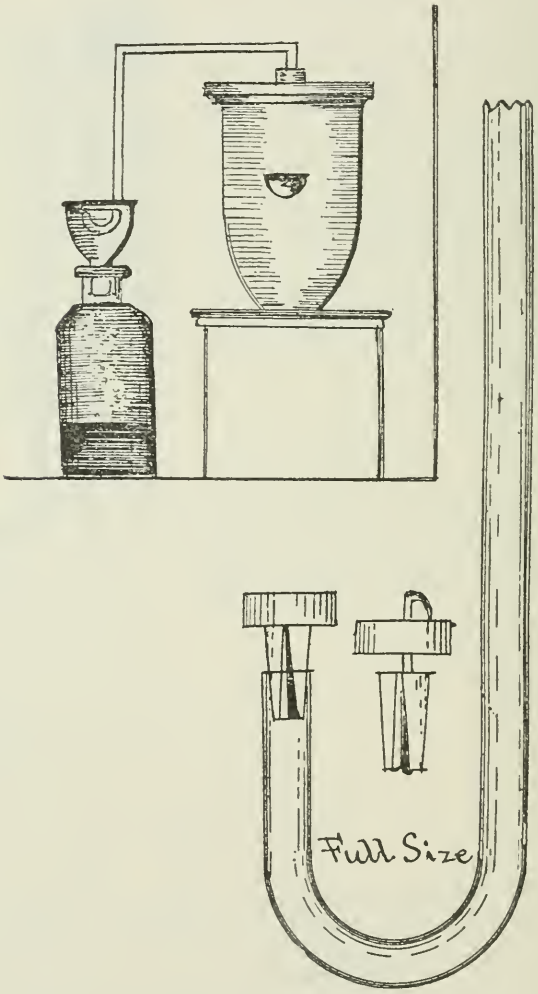
Extraction Flask.

The ordinary flask of about 150 Cc. capacity is provided with a side tube fused on a little above the centre and ground to fit into the neck of a weighing flask of about 10 Cc. capacity, and extending a little way into it, as shown. Having been cleaned, heated, cooled and weighed, it is attached to the extraction flask, and the extraction made in the usual way. When the extraction has been completed, of an oil, for instance, and the solvent has been sufficiently evaporated off, the solution of the oil is easily transferred to the weighing flask,

while the large flask may be rinsed by the vapor rising from the oil solution on gently warming the weighing flask. When this operation is completed, the solvent is completely evaporated, and the little flask and contents are dried and weighed.—Chem. News, Jan. 26, 1900, *45*.

Percolation — Expeditious Mode of Moistening the Powdered Drug.—

FIG. 17.



Syphon Percolator.

E. G. Eberle suggests the following expeditious and convenient mode of moistening powder for percolation. Place the powder into an ordinary can, add the menstruum designated to moisten the powder, stir thoroughly

with a stick, put one or two large glass stoppers in the box, place the lid on and shake thoroughly; label and place on the counter or shelf to remain for the length of time required for proper maceration. Shake the can frequently in the meantime. This insures thorough moistening; prevents loss by evaporation: the glass stoppers prevent the lumping up of the powder. — Drugg. Circ., Jan., 1900, 11: from Proc. Texas Pharm. Assoc., 1899.

Percolators—"Sprinkle" Stoppers as Outlets.—F. N. Strickland has used "sprinkle" stoppers with advantage as outlets for percolation. This being properly fitted and screwed tight, the drug is packed as usual, the menstruum poured on, and the outlet unscrewed enough to regulate the flow as desired.—Drugg. Circ., June, 1900, 116.

Syphon Percolator—A Simple Regulator.—Joseph R. Wood states that a simple device to avoid the inconvenience of raising and lowering the syphon-tube and receiver, in regulating the flow from syphon percolators, may be made from two corks, held together by a pin, as shown in the accompanying cut (Fig. 17). For tubing of one-quarter inch internal diameter, for instance, a small, V-shaped incision is made the entire length of a number O cork, about one-sixteenth of an inch deep at the bottom of the cork, and nearly flush with the surface at the top. Then, from the top of a number six or seven cork is cut a section about one-eighth of an inch thick. The latter is pinned to the number O cork with a pin of sufficient length to protrude about a quarter of an inch after having passed through both corks. The protruding point is then bent over. The functions of the top piece are to prevent the tincture from flowing out in a jet, and cause it to fall back into the receiver in drops. In use, the regulator is simply inserted into the syphon-tube exit, far enough to maintain the proper speed of flow.—Pharm. Era, Sept. 14, 1899, 359.

FILTRATION.

Filtering Apparatus—A Useful Device for Volatile Liquids.—Jos. F. Hostelly describes a number of devices to facilitate the filtration of volatile fluids, which are constructed on a well-known principle modified somewhat in its application. Three different apparatus are shown in the accompanying cuts (Figs. 18, 19, 20), and require very little explanation. The essential features are air-tight connections between the cover and the receiving bottle, which are effected by the aid of rubber tubes, and by means of one of the covers shown by Figs. 21 and 22, the first one (Fig. 21) being particularly adapted to the narrow, nearly straight form of percolator, while that shown by Fig. 22 is adapted to the more conical forms of percolators. Omitting the author's specific directions, it suffices to say that the cover consists of a disc of wood, one inch thick, bearing a curved cleat diametrical across the surface, by means of which and a hinged wire it is pressed tightly upon a rubber washer interposed between the under

surface of the cover and the rim of the percolator. For the larger mouthed conical percolator, clamps are used as shown by Fig. 22, the rim of the

FIG. 18.

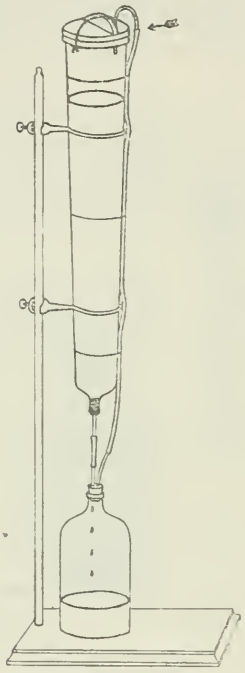


FIG. 19.

FIG. 20.

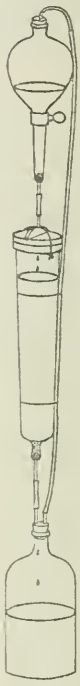


FIG. 21.

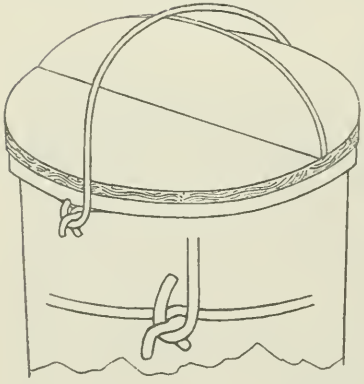
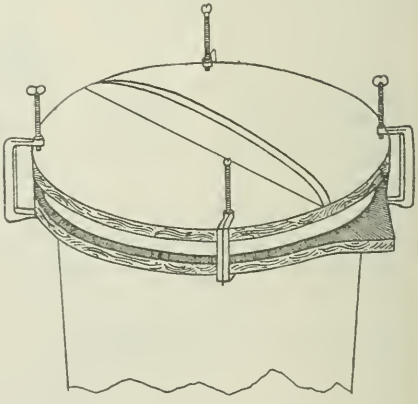


FIG. 22.



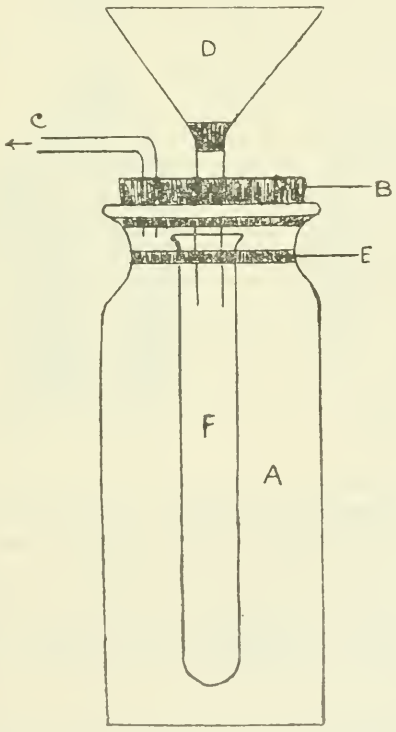
Filtering Apparatus.

percolator being protected by a flange of one-inch wood affixed beneath, so that the clamp may exert direct pressure upon wood alone. Fig. 18

shows the simplest form of filter; Fig. 19 a filter with automatic supply bottle; and Fig. 20 a filter surmounted by a separatory funnel, by means of which the supply of liquid may be regulated at will. Other forms of apparatus, carrying out the same general idea of filtration under exclusion of contact with external air, are described and figured in the original paper in Drugg. Circ., May 1900, 91–93.

Vacuum Filter—Simple Construction. — E. W Lucas recommends the simple apparatus shown by Fig. 23 for filtering into test-tubes direct, and thus avoiding the necessity of transference. An ordinary wide-mouthed 8 oz. bottle, *A*, is provided with a bi-perforated rubber stopper, *B*, bearing the bent tube, *C*, through the smaller perforation, and the funnel, *D*,

FIG. 23.



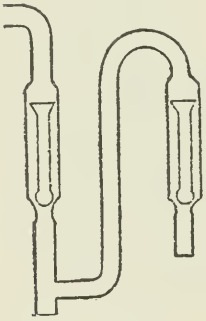
Vacuum Filter.

through the larger central one. A shallow cork, *E*, perforated with a hole large enough to loosely suspend the test-tube, *F*, by its lip, is previously inserted and completes the apparatus, which is connected with the filter-pump at *C*. If desirable, a simple pressure-gauge may be improvised by interposing a T-piece between the tube *C* and the filter-pump, the suitably lengthened limb of the T-piece dipping into mercury. A vacuum of

six inches is usually sufficient. When dealing with small quantities, the author prefers to use a conical plug of bath-brick as filtering material. This may be made to fit perfectly by winding with a few strands of silk asbestos; will stand any pressure, and is very readily washed. — Pharm. Journ., Dec. 30, 1899, 623.

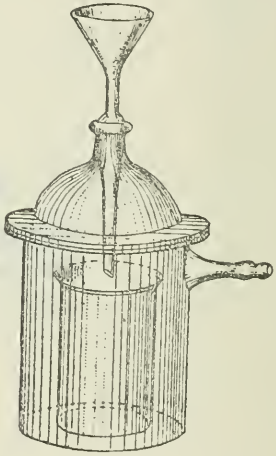
New Aspirator—Construction with Glass Valves.—A. Rosenheim describes a new aspirator, which differs chiefly from those of the usual construction by the addition of the simple glass valve shown in the accompanying cut (Fig. 24). The glass rods with rounded ends make valves

FIG. 24.



New Aspirator.

FIG. 25.



Water-Pump Filter.

which are absolutely tight to small pressures from one side, but readily moved by slight pressure from the other. In the author's original paper the aspirator set up for use is shown in the illustration, and also in Merck's Rep., Oct., 1899, 453; from Jour. Soc. Chem. Ind., xviii, 707.

Water-Pump Filtration—Convenient Arrangement.—Max Koehler & Martini (Berlin) supply the filtering arrangement shown by Fig. 25, which has been devised by Witt and Herron for the convenient collection of filtrates in vessels which cannot be connected with a water-pump, such as crystallizing dishes, beakers, etc. It consists of a thick-walled, well-enameled cylindrical vessel, provided with a side exhaustion tube, to which is connected the rubber tube of the pump. The rounded cover is ground on, so as to be air-tight, and supplied with a funnel, which is also ground in. When the apparatus is to be used it is connected while empty with the pump, and the filter fitted into the funnel in the usual manner. The lid is then removed and the receiving vessel set in the cylinder, and the filtration conducted as usual. The apparatus is especially of service where

it is necessary to filter hot liquids which on cooling deposit crystals.—Pharm. Rev, March, 1900, 132; from Chem. Centralbl., 1900, 2.

Continuous Filtration and Washing—Description.—Harold H. Stevens describes and figures a practical and commercial device for continuous filtration or washing precipitates. The idea is not new, and deserves attention only in the application. Filters prepared as usual are fed from above automatically from large bottles, suitably supported, the mouth of which bears a tube 1½ in diameter and 6 inches long, dipping into the liquid on the filter after passing through a cover of heavy sheet rubber to prevent evaporation.—Merck's Rep., Aug., 1899, 348–349.

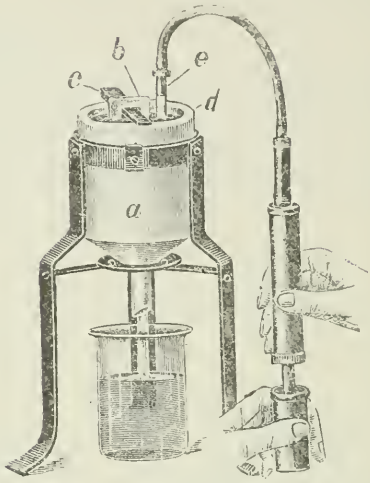
Water Filter—A Handy Contrivance.—Dr. Willis Cummings describes a water filter which seems to be both handy and useful. The materials necessary are a small wide-mouthed bottle, a piece of rubber tubing, fitted with a collar at one end and a mouthpiece at the other, some absorbent cotton, and, if convenient, some charcoal, sand, or other similar filtering material. The tube being inserted and held in place so as not to absolutely touch the bottom, the vial is filled to about one-third its height with absorbent cotton, a good layer of charcoal is then introduced, and then again cotton up to the neck, packing it, but not too tightly, sufficient to hold it in place. It is well to have a separate pledget of cotton on top, so that it may be renewed from time to time, as required. The application of this is obvious. On introducing it into a pitcher or other suitable vessel containing water—but so that the bottle may lie side-ways—and draining at the mouthpiece, a current of filtered water is at once established and may be made continuous by replenishing the water as it is filtered off. In the original paper the apparatus is shown by a figure.—Merck's Rep., Jan., 1900, 4.

Filtering and Percolating Cabinet—Practical Construction.—Joseph F. Hostelley describes and illustrates a filtering and percolating cabinet which deserves attention, particularly on account of the economy in space. It embraces a book-case, a small closet and writing desk, with divers drawers and pigeon-holes for the preservation of journals, wherein are chronicled formulæ and data pertaining to the manufacture of galenical products. The description in detail may be consulted in Amer. Drugg., Dec. 11, 1899, 323.

Filter-Press—Simple Construction for Laboratory Use.—Dr. Wolf von Loeben describes the simple filter press shown by Fig. 26, which is conveniently used for small operations and avoids the necessity of the customary suction filter. It is operated as shown by means of an ordinary bicycle pump. The porcelain funnel *a* is provided with a perforated disc upon which a double paper filter is placed and held in position by two half-rings, also of porcelain. The porcelain cover, provided with the handle, *b*, admits the compressed air through the tube, *c*. It is held in position by

means of the wooden wedge, *c*, which passes through *b* and rests on the

Fig. 26.

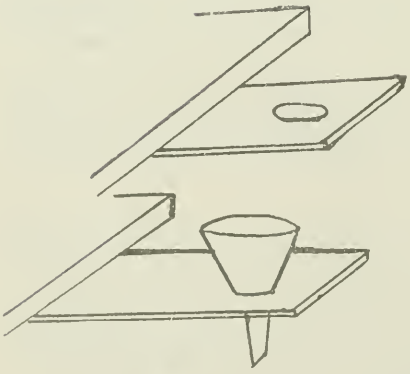


Filter-Press.

edges of the funnel *d*, the cover being pressed up against a flange protected by a rubber ring.—Pharm. Centralh., Dec. 14, 1899, 779.

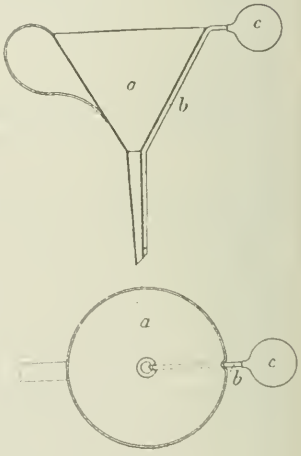
Funnel Support—Convenient and Cheap Construction.—Simple ex-

Fig. 27.



Funnel Support.

Fig. 28.



Safety Funnel.

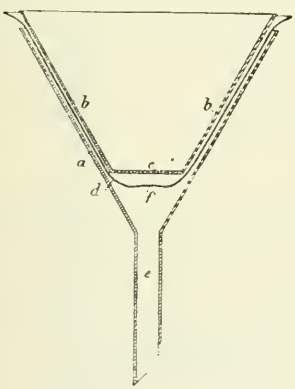
pedients, even though they may be well known, are frequently lost sight of. Such is the device shown by Fig. 27, which is recommended by A. B.

Burrows as a support for funnels at the prescription counter. A round hole is made into a thin board at one end, large enough for the reception of a funnel, and a small hole at the other end for the reception of a screw, by means of which it is fastened to the under part of the shelf in such manner that, with the screw as pivot, it may be swung under it and out of sight, or forward when it is required for use. The author also describes a "powder folder," which is constructed on a similar principle under the lowest shelf of the prescription counter and supported by a hinged upright, which, when the folder is not in use, is held against the horizontal under surface of the folder by a small clamp.—Merck's Rep., May, 1900, 192.

Safety Funnel—A Novel Device.—W. Lindeck has devised (and applied for a patent) the safety funnel shown by Fig. 28, by means of which non-transparent vessels, such as jugs, cans, barrels, etc., may be filled without danger of running over. To a funnel of ordinary construction a tube of thick glass is fitted, reaching not quite to the lower extremity of the funnel and ending above in an elastic ball, attached hermetically to the bent extremity. To prevent the accidental breakage of the tube, as fas as possible, the funnel may be formed, if of metal, so as to partly envelop the glass tube. During use, the elastic ball is frequently pressed with the hand, when, as soon as the liquid in the vessel to be filled reaches the orifice of the tube, a portion of it is aspirated into the tube and becomes visible to the operator.—Pharm. Ztg., Sept. 27, 1899, 688.

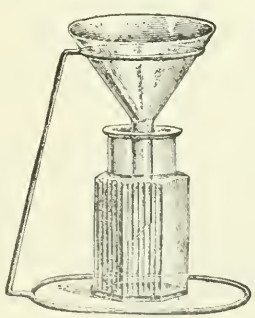
Funnel With Strainer—A Useful Device.—W. Loewy recommends the funnel, provided with a strainer, shown by Fig. 29, which he finds useful

Fig. 29.



Funnel With Strainer.

Fig. 30.



Wire Funnel Support.

for a variety of pharmaceutical operations. The strainer, *b b*, which is truncated beneath and provided with numerous small perforations, *c*, fits the size and shape of an ordinary glass funnel, *a*. Between the funnel

and the strainer, ordinary filter paper or muslin cloth *d*, is interposed so as to leave a space, *f*, beneath, which is filled either with absorbent cotton or glass wool, through which the filtrate finally passes into the tube *e*, and thence into the vessel provided for its reception.—Pharm. Ztg., March 14, 1900, 201.

Wire Funnel Support—Convenient Construction.—Omeis has designed the filter support shown by Fig. 30, which is constructed of brass wire, and is specially intended for the support of funnels when filtering small quantities of fluids, such as morphine solution and the like.—Apoth. Ztg., Nov. 11, 1899, 678.

Toughened Filter Paper—Production with Ammonio-Zinc Chloride.—During some experiments undertaken by F. H. Alcock with the object of determining the best means of wholly extracting the alkaloids from cinchona bark, use was made of an aqueous solution of zinc chloride, the liquid was poured off and ammonium hydroxide added in excess, and the alkaloids thus precipitated separated by paper filtration. On drying the paper filter it was found to be tough and more like parchment paper, but retained its filtering power. Some paper was afterwards moistened with solution of ammonio-zinc chloride alone, and after washing with water and drying, it possessed the "toughened quality." The paper when incinerated yielded an ash containing a little zinc compound, but by more perfect washing this may possibly be reduced, and paper so treated found useful for some filtering operations.—Pharm. Journ., May 19, 1900, 524.

APPLICATION OF HEAT, DISTILLATION.

A New Thermometer Scale.—A. Betts has devised a milligrade thermometer on a scale in which the freezing point of mercury is the zero and its boiling point is 1000. According to this scale, which bears the relation to the Fahrenheit scale as 7 to 1, water boils at 360 degrees, the point of aqueous congelation is just above 100 degrees, and 200 degrees milligrade equals 100 degrees Fahrenheit. For ordinary purposes minus degrees are abolished.—Scient. Amer., 1900, *82*, 170.

High Temperature Thermometers—Construction of Quartz.—Taking advantage of the fusibility of quartz in the flame of the oxyhydrogen blow-pipe, in which it assumes a plastic state before melting, A. Dufour has constructed a thermometer for high temperatures which has a quartz bulb and stem. Tin is used for the liquid, since it is readily obtained in a pure condition, has a relatively low melting-point, and is not appreciably volatile below a red heat. The thermometer is filled with molten tin by aspiration. After obtaining as perfect a vacuum as possible in the stem, it is sealed in the oxyhydrogen blow-pipe. The last few bubbles of air are got rid of by melting the tin and giving the thermometer repeated shocks. If the tin forms a trace of oxide this collects in the bulb and remains there. The meniscus in the stem is always very bright, resembling that of a mer-

cury thermometer. The bulb must be thick, otherwise the tin, in contracting, will fracture it. The author suggests that the tubes of quartz are likely to prove valuable for spectroscopic work, obviating the difficulty of obtaining a pure spectrum, which is not possible under certain conditions, when glass tubes are employed. Commenting on this note, Armand Gautier states that in 1869 he succeeded in making small tubes of quartz, employed as air thermometers, as coils for causing gaseous mixtures to circulate in unalterable capillary tubes, in the course of his researches on the influence of temperature on the combination of gases.—Pharm. Journ., May 5, 1900, 463; from Compt. rend., *130*, 775 and 816.

Melting Points—Determination by Different Methods.—The differences found in the melting points of various pharmaceutical compounds as compared with those given by the Br. Pharm., has suggested to Thomas Tyrer and Albert Levy a series of determinations of melting points by different methods. Selecting for this purpose sulphonal, acetanilid, phenacetin, and phenazone, the melting points of each were determined by five methods, viz.: The B. P., 1898, method; Graebe's method; Landolt's method; Piccard's method; and Loewe's method. These methods are described with illustrations of the necessary apparatus, and the results obtained are given in a series of tables which must be consulted in the original. They show that the results by the B. P. method are somewhat high, but that Graebe's and Landolt's methods agree fairly well.—Trans. Brit. Pharm. Conf., 1899, 427–431.

Bunsen-Burner—Simple and Improved Construction.—Dr. F. Alliston

FIG. 31.

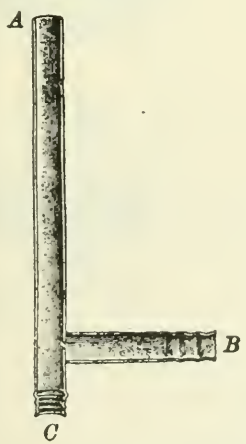
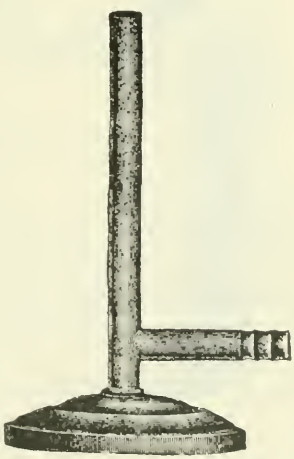


FIG. 32.



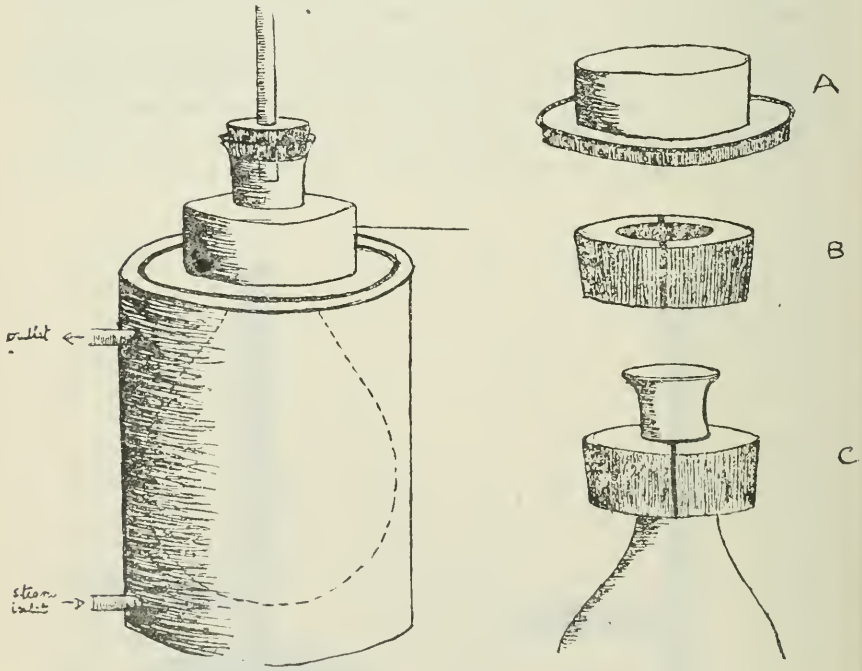
Bunsen Burners.

has constructed a simple Bunsen-burner on the principle of Hugh Mar-

shall, which does away with the pointed influx tube for the admission of gas, this being replaced by a small hole bored laterally with an upward slant into the burner. The construction is shown by the accompanying cut (Fig. 31). On the side of the burner, *A*, the tube, *B*, is soldered rigidly over the small slanting hole for the admission of the gas, while air is admitted from the bottom of the burner at *C*, which is screwed into a convex base in the otherwise usual manner, the whole presenting the appearance of the conventional Bunsen burner, as shown by Fig. 32. The advantage of this construction, apart from economy, is the non-liability of the influx of gas to become obstructed by either solid or liquid impurities reaching the interior of the burner; and if it does, the burner tube being open at both ends, such impurities are easily removed by passing a brush through the tube.—Apoth. Ztg., Dec. 13, 1899, 748; from Chem. Ztg., 1899, 996.

Steam Bath—Economical Construction for Heating Flasks, etc.—E. W. Lucas suggests the arrangement shown by Fig. 33 as being particularly

Fig. 33.



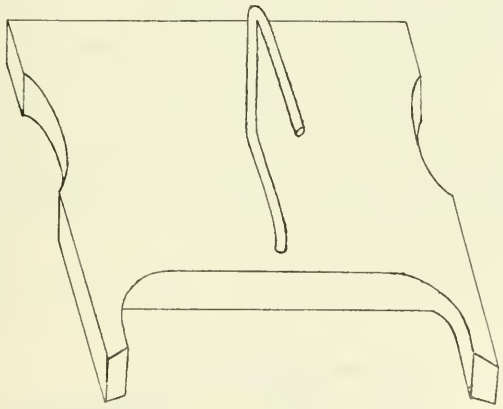
Steam Bath

serviceable for heating ether flasks in fat determinations. An ordinary two-pound paint can with push-down lid is chosen, and a two-inch hole cut in the centre of the lid. Round this hole a one-inch flange is soldered, as

shown at *A*, while two short metal tubes are soldered into the side of the can half an inch from the top and bottom respectively, for the inlet and exit of steam. The flask should fit into the can as shown by the dotted outline in the cut, and is held in place by means of the cork collar shown at *B* and *C*, which must fit practically steam-tight into the flange, *A*, and is constructed in two halves for obvious reasons. If the lower opening is omitted or stoppered, the bath may be used as a hot-water jacket.—Pharm Journ., Dec. 30, 1899, 623.

Porcelain Evaporating Dishes — Convenient Handle for Moving Them When Hot.—Joseph F. Hostelley has devised handles designed for moving hot porcelain evaporating dishes, the construction of which is shown by Fig. 34, while the application is shown by Fig. 35. The two handles needed are fashioned from pieces of hard wood, well sand-papered, and measure about 4 inches square by ½ inch thick, and shaped as shown. The hook-like projection or finger, which reaches over the rim of the dish,

FIG. 34.

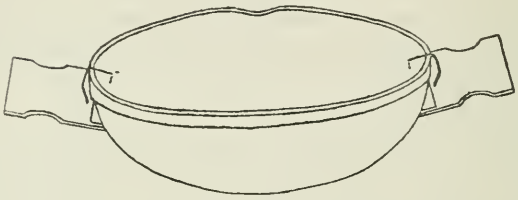


Construction of Porcelain Evaporating Dish.

is a piece of wire bent in this form, and which is securely held in position on the handle by being forced through the latter, bent flat against the opposite side, and held firm with little wire staples, driven into the wood so as to embrace the wire ends. The ends of the wooden prongs are cut across diagonally, in order to make them better coincide with the contour of the dish to be lifted, and so hold it more securely. These prongs are about 1½ inches long, inner measurement. The handles should be made so that the grain of the wood runs lengthwise of these projections, not across them. It has been suggested, and it is doubtless a good plan, that the wire fingers be made a little longer, with the ends bent downward a trifle to assure the safety of the dish, as shown in Fig. 2. In use, the handles are grasped firmly in either hand, held well against the vessel to

be carried, the wire finger of each resting over the edge ; an upward pressure is exerted on the parts of the pieces nearest the dish, a downward

Fig. 35.



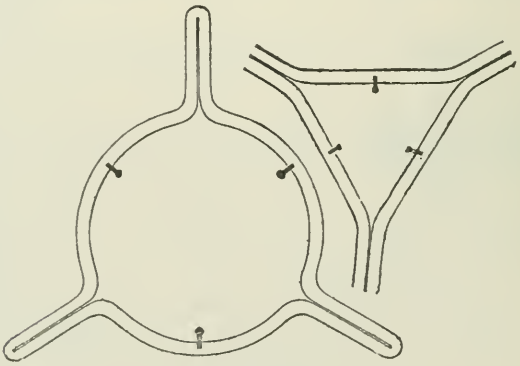
Application of Porcelain Evaporating Dish.

pressure on those more distant, and the receptacle is lifted. — Merck's Rep., June, 1900, 241.

Glass Vessels—Loss in Weight during Evaporations.—W. Büttner calls attention to the liability of glass vessels, such as capsules, beakers, etc., to lose in weight even during ordinary evaporations on the steam bath, and the consequent liability of error in making the necessary weighings in quantitative determinations for which it is convenient or desirable to use them. He gives figures from practical observations which show in one case a loss of 0.0030 Gm., in another a loss of 0.0036 Gm., in a total weight of the vessel of 51.245 Gm. As a precautionary measure against errors arising from this source, he, therefore, advises that the vessel and its contents be weighed together after the drying is completed, then to remove the contents completely and weigh the cleaned and empty vessel.—Pharm. Centralh., Aug. 17, 1899, 501.

Triangles—Improved Construction for Small Dishes and Crucibles.—

Fig. 36.



Triangles.

Dr. A. Heberbrand has designed the improved forms of triangles for the support of small dishes and crucibles shown by Fig. 36, which are intended

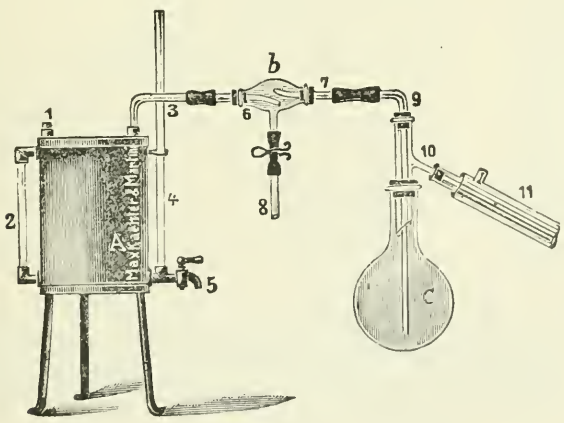
to obviate the loss of heat carried off by triangles of ordinary construction, as evidenced by the dull-red line visible at the line of contact when heating these to bright redness. They are constructed of heavy iron wire, or, better, nickel wire, and in the forms shown. At three equidistant points short platinum pins with round heads are inserted, and on these the vessel rests, thus diminishing the contact to a minimum, and enabling every part of it to be equally heated.—Merck's Rep., March, 1900, 117; from Chem. Ztg., xxiv, 37.

Glass Rods—Precautions Against Breakage.—E. G. Eberle suggests that the breakage of glass rods when kept in drawers is avoided by affixing two spiral pen racks to the bottom of the drawer, when the rods can be kept in place by inserting them as you would a penholder. Another method is to join about a dozen of the well-known spring clamps used for hanging clothes. After joining them together tack them to the inside of the door of the closet containing the mortars, where the rods can be conveniently held in place by these clamps.—Drugg. Circ., Jan., 1900, 11.

For the same purpose, Joseph F. Hostelley has designed a rack, consisting of parallel wire hooks fastened to an upright board, upon which the rods are placed when not in use. The hooks may also be replaced by grooved strips of wood fastened horizontally to the board, into which the rods may be laid for security.—Ibid., Sept., 1899, 199.

Apparatus for Distillation with Steam—Construction for the Experimental Laboratory—Raabe has devised the complete apparatus for distillation with dry steam shown in the accompanying cut (Fig. 37), which

Fig. 37.



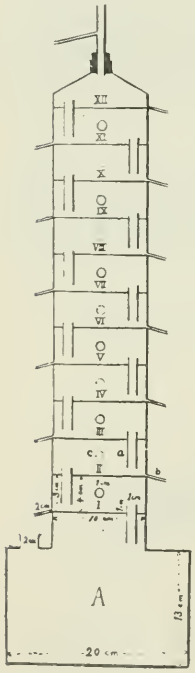
Apparatus for Distillation with Steam.

consists of three essential parts: *A*, the steam generator; *b*, the water separator; *C*, the distilling flask. The steam generator is made of sheet copper with extra strong bottom, and has an opening (*1*) for filling, water

gauge (*2*), opening for receiving the distilling tube (*3*), pressure gauge (*4*), and stop-cock (*5*) for emptying this part of the apparatus. The difference in height of the water in *4* and in the water guage (*2*) gives the pressure in the apparatus. The tube *3* connects with the water separator *b* by means of the tube *6*, which is bent downward at the end. The steam escapes through *7*, whereas the condensed water can be drawn off through *8* from time to time. The dry steam is then conducted into the distilling flask *C* through the tube *9*, which reaches to near the bottom of the flask. The vapor then passes through *10* into the condenser *11*.—Pharm. Review, Sept., 1899, 403; from Ztschr. f. angew. Chem., 1899, No. 16.

Fractional Distillation—Illustration by Means of the Distilling Column.—In order to give a more satisfactory explanation of the principle of fractional distillation and the use of distilling columns or dephlegmators for the more perfect separation of substances by distillation, Oswald Schreiner has designed the model column shown by Fig. 38, by means of which he is able to give experimental proof of the principles involved in this operation.

Fig. 38.



Model Column.

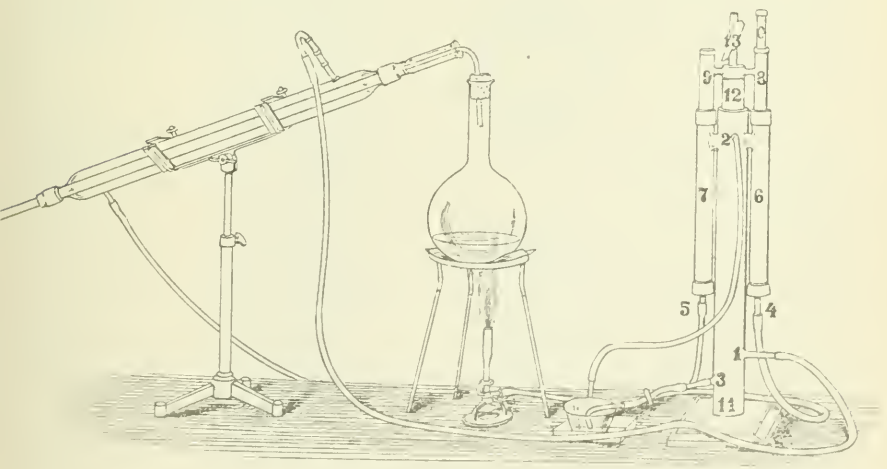
The entire apparatus, with the exception of the glass distilling tube at the top of the apparatus, is constructed of galvanized iron. It consists of a round receptacle or still (*A*), 20 cm. in diameter and 13 cm. high, and is provided with a hole through which the liquid to be distilled is introduced. On top of this still are placed twelve chambers, each being 10 cm. in diameter and 4 cm. high. These chambers are connected one with the other by a tube (*a*). This tube is 1 cm. in diameter and just 4 cm. long, and is fastened in the diaphragm between the chambers so that 1 cm. projects into the upper chamber and 3 cm. into the lower chamber. A similar tube is inserted in the next diaphragm, but on the opposite side of the chamber, so that the vapors in going from tube to tube must circulate through the chamber. The outlet tube (*b*) at the bottom is stopped up by means of a short rubber tube closed at one end by a small glass rod. Each chamber is also provided with a 1 cm. lateral opening (*c*), alternately on opposite sides of the apparatus as shown by the full and dotted circles in the figure. These openings receive a well-fitting cork carrying a thermometer. The distilling tube at the top is also provided with a thermometer and connected with an ordinary Liebig condenser.

The operation is as follows: Two liters of the dilute alcohol to be distilled are put into the still (*A*), the opening corked and heat applied with

a Bunsen burner. The first vapors given off are very rich in alcohol, but condense in the cold chambers above. As the operation goes on, the richer alcohol is driven from chamber to chamber, upward by the hotter (higher boiling vapors in the chamber below until it finally distills over. In being driven thus from chamber to chamber, the thermometer will show successively a gradual rise in temperature. After the distillation has gone on for some time, the liquid condensed in the chambers has collected on the bottom, and when it has risen to the height of the tube (*a*), it flows over and runs into the next lower chamber, and there the vapors richer in alcohol are again distilled off and go upward. This flowing down and revaporization of the alcohol is continuously taking place. The result is that at the end of the operation the original dilute alcohol has been separated into a fairly pure alcohol which has distilled over into the condenser and less pure fractions in each of the chambers, the percentage strength of the alcohol decreasing as we go down in the apparatus. In order to show this, the apparatus is allowed to cool and the liquid which has condensed in each chamber drawn off through the outlet tube (*b*) into a small flask. By taking the specific gravity of each of these portions, their percentage strength in alcohol may be found by comparison with a table.—Pharm. Rev., Jan., 1900, 8–12.

Distillation—Automatic Device for Cutting off the Flow of Gas.—Prof. J. M. Pickel has devised an apparatus by means of which the flow of

FIG. 39.



Automatic Device for Cutting off the Flow of Gas.

gas is cut off automatically if from any cause the inflow of condensing water during distillation should cease. The apparatus is shown in the accompanying cut, Fig. 39, attached to a Liebig's condenser. The water,

after circulating in the condenser, passes into the cut-off by the tube *1*, and out partly by the upper outlet tube *2*, and partly by the lower tube *3*—the thumb-screw clamp on *3* permitting the out-flow to be thus divided. The central part of the cut-off (*11*), is a cylindrical vessel about 12 inches long by 1½ inch in diameter; to it are attached the two cylinders, *7* and and *6*, each of which is about 10 inches long by 1 inch in diameter. Two small horizontal tubes connect these two cylinders with *11*, permitting water to flow over them from the latter into the former. Inside of *11* plays up and down the cylinder *12*, which is sealed up and contains only air; it should be about 13 inches long, and of such diameter as to play up and down without friction in *11*. To *12* are attached the tubes *8* and *9*. These tubes communicate with each other by a small horizontal tube, and play up and down in *7* and *6*. *8* is closed at the top by a cork, through which passes, air-tight, the tube *0* down to within about 2 inches of the end of *8*. How low to place *0* will have to be ascertained by trial. The tubes *8*, *9* and *0* are all closed at the top, but open at the bottom or sealed by water only. So long as water is passing through the condenser and the cut-off, the cylinder *11* is (by properly regulating the clamp on *3*) kept full, and *12* floats and carries up with it *8*, *9* and *0*. In this position the gas, entering by *4*, passes into *0* and *8* across to *9*, and thence down and out by *5* to the Bunsen burner. When the water is cut off, *11* is soon drained by the lower outlet tube *3*, and *12* sinks, carrying with it *8*, *9* and *0*; and the passage of the gas is stopped by the water in *6* or *7*, which always remain full. In a second cut, not here reproduced, the details are shown in the form of a diagram. A second device is also shown and described, but must be consulted in the original paper.—Drugg. Circ., March, 1900, 47–48.

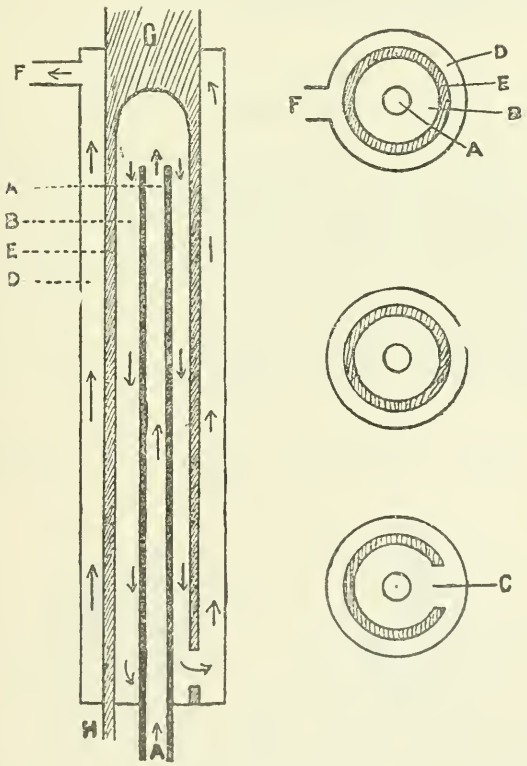
A New Condenser—Efficient Construction for Distilling Water.—E. W. Lucas describes a new form of condenser, shown by Fig. 40, which is claimed to possess great efficiency and superiority over the usual forms employed for distilling water. It practically consists of an *annular* steam space, the inner and outer sides of which are contiguous to cooling surfaces. This distinguishes it from forms of condensers where the steam space is *columnar* or *cylindrical* and contiguous to only one cooling surface. Reference to the cut shows that the cooling water first ascends a comparatively narrow tube *A*, and projects against the under side of the dome. The concave end returns the water down the second and wider tube, *B*, through an orifice in the steam space, *C*, to the outer tube or jacket, *D*, which it completely traverses before escaping at the outlet, *F*, the course being indicated by the arrows, and easily followed. The steam enters at *G*, and at once impinges on the cold dome, where it loses most of its heat and practically condenses. The condensate is then pushed down the annular space by more steam from above, until it finally escapes at *H*. In three tests made with a copper condenser having a condensing

area of 100 sq. inches, its extreme length 15 inches and the diameter 2 inches, the following results were obtained:

	I.	II.	III.
Cooling water, gallons per hour	220	220	220
Cooling water, temperature at inlet	58° F.	58° F.	58° F.
Cooling water, temperature at outlet	98° F.	101° F.	104° F.
Condensate, gallons per hour	7.30	9.00	10.20
Condensate, temperature	130° F.	170° F.	197° F.
Steam pressure in lbs. per sq. inch	15 lbs.	20 lbs.	25 lbs.
Duration of experiment	1 hour	1 hour	1 hour

– Trans. Brit. Pharm. Conf., 1899, 470–474.

FIG. 40.

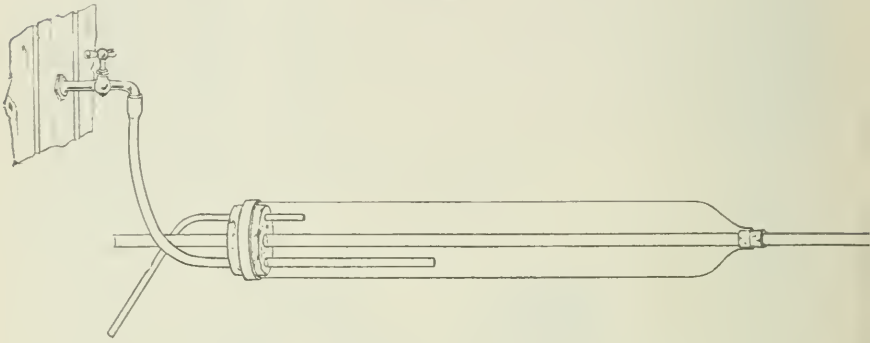


A New Condenser.

Condenser—Construction from a Glass Percolator.—F. N. Strickland describes several useful "home-made" laboratory apparatus, and among these the condenser shown by the accompanying cut (Fig. 41), which

may be constructed from an ordinary glass percolator as follows: Fit both ends of the percolator with good corks. In the larger cork cut 3 holes, and in the smaller, a single hole. Through the center hole of the larger cork, pass a piece of stout glass tubing $1\frac{1}{2}$ inches in diameter and long enough to project 5 inches from both ends. In the upper hole fit another

FIG. 41.

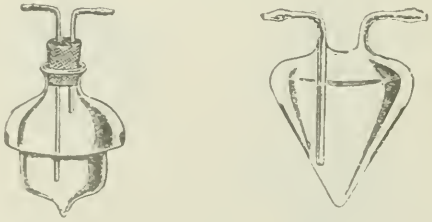


Condenser.

glass tube 6 inches long and $\frac{1}{4}$ inch in diameter, so that it will just extend inside the cork. To the outer end of this tube attach rubber tubing enough to carry the overflow into a suitable receptacle. The lower hole in the cork is fitted with another piece of glass tubing, of a somewhat larger diameter than that of the escape tube, and it must be long enough to extend into the percolator at least one-third of its length. The other end of this tube is connected by means of tubing with a faucet or tank, which furnishes the water for cooling the condenser.—Drugg. Circ., April, 1900, 72.

Reflux Condensers—Construction for Beakers.—Dr. Gockel has devised

FIG. 42.



Reflux Condenser.

the two forms of condensers shown by Fig. 42, which are designed to be placed in beakers in order to prevent unnecessary loss of volatile solvents during operations of boiling for prolonged periods. As shown in the illustration, one of these condensers rests directly on the rim of the beaker,

whilst the other, conical in shape, rests within the flaring portion of the rim. Suitable grooves are provided whereby atmospheric equilibrium is maintained and excess of pressure within the beaker avoided.—Merck's Rep., Aug., 1889, 361; from Pharm. Ztg., xliv, 403.

MISCELLANEOUS SUBJECTS.

Water Taps—A Simple Splash-Preventer.—Calling attention to a simple little filter attachment to the tap of water-pipes whereby splashing is prevented under any pressure and with undiminished flow, the "Brit. Journ. Phot." calls attention to another very simple means by which the same effect may be accomplished very economically. No matter how violently water may issue from a tap through pressure at the main, the violence will be quite destroyed if a short piece of india-rubber tubing be slipped over the end of the tap. The bore of the tubing will be necessarily larger than that of the tap, and, the issuing column of water having its sectional area increased, the pressure is necessarily, *pro rata*, reduced. —Pharm. Journ., Sept. 23, 1899, 311.

Desiccating Agents—Superiority of Sulphuric Acid over Calcium Chloride and Potassium Carbonate.—N. Elborne has studied the relative behavior of sulphuric acid, sp. gr. 1.843, fused calcium chloride, and dry potassium carbonate as desiccating agents. Equal weights of the three substances were simultaneously exposed under similar conditions to the action of the atmosphere of the laboratory, and their respective increase in weight noted after intervals of 24 hours, with results as follows:

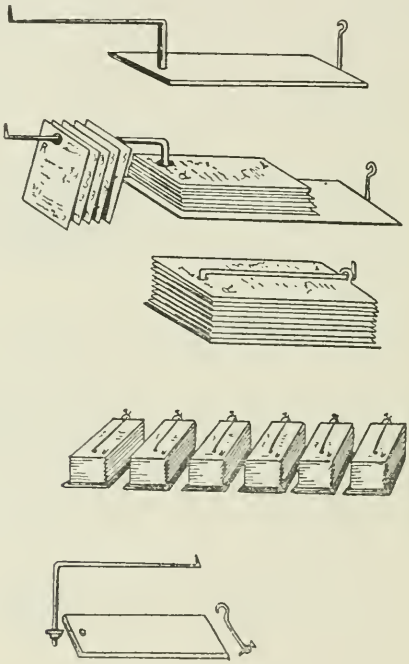
	Original weight.	Approximate weight per 24 hours' exposure—grains.				
Sulphuric Acid	258 grs.	315	356	397	432	464
Calcium Chloride	258 "	285	307	331	368	405
Potassium Chloride	258 "	293	308	310	322	328

—Pharm. Journ., July 8, 1899, 26.

Prescription Conveniences—Triturations and Solutions.—A. E. Hiss recommends solutions and triturations of various substances very convenient for use at the prescription counter. *Triturations* used by him are made from the following substances: Strychnine sulphate, 1 in 12; arsenous acid, 1 in 8; Calomel, 1 in 8; Atropine sulphate, 1 in 30; Morphine sulphate, 1 in 8. *Solutions* from the following: Boric acid, saturated; Copper sulphate, saturated, or 1 in 3; Potassium chlorate, saturated; Ammonium carbonate, saturated, or 1 in 4; Potassium nitrate, 1 in 4; Potassium citrate, 1 in 2; Potassium bromide, 1 in 2; Ammonium chloride, 1 in 2; Sodium bromide, 1 in 2; Sodium phosphate, 1 in 8; Zinc sulphate, 1 in 10, etc., etc.—Bull. Pharm., Dec. 1899, 497.

Prescription File—A Home-made Contrivance.—E. Marshall describes the home-made prescription file shown by the accompanying illustration (Fig. 43). It consists of a small board 7x4 inches, having a wire inserted at one end, fastened by a button, the details being shown by *1* and *5*. When dispensing repeats the prescriptions are slipped out on this wire, and thus

FIG. 43.



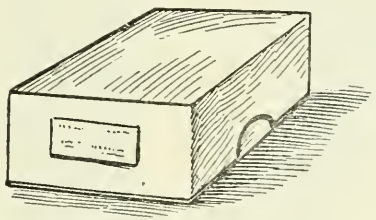
Prescription File.

kept out of the way of the one under repetition, as shown by *2*. After the file is full the wire is turned and fastened, as shown by *3*, the appearance of the files being further shown by an array of six in the drawing.—Amer. Drugg., May 28, 1900, 338.

Prescription Filing—A Convenient Plan. — Methods of caring for and filing prescriptions are almost as numerous as individuals, much depending on opportunity and convenience. A very simple and convenient plan is the following, proposed by John B. Dixon: Before filing the prescription ascertain the patient's name, where the physician has failed to include it, and write it plainly at top of the prescription, placing also, in addition to number and date, the price charged, and on reverse side any memoranda of procedure or data regarding any special preparation used, or other facts pertaining to the prescription, which would be desirable to know in case it was repeated. It is then placed on a spindle on prescrip-

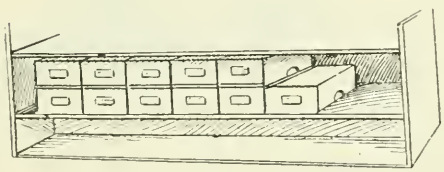
tion counter, the top prescription, of course, always representing the last number. As often as two hundred prescriptions accumulate on the spindle, they are simply lifted off, arranged uniformly, a rubber band put around them, and the prescriptions placed in pasteboard boxes (Fig. 44),

FIG. 44.



Box for Prescriptions.

FIG. 45.

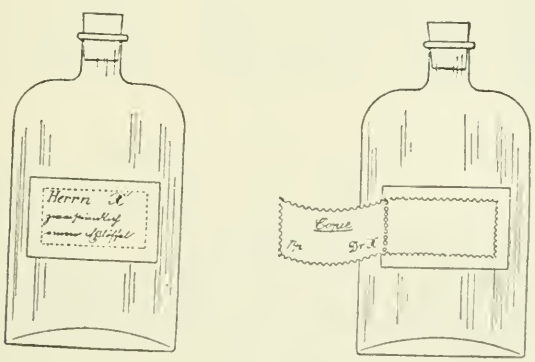


As Boxes Appear on Shelf.

measuring about 5 x 6 in. They are labeled, showing plainly the number and date of the first and last prescription in the box. As the boxes accumulate they are stored on a shelf within convenient reach or in any easily accessible place, and as they are of uniform size, shape and color, they make a neat and systematic show (Fig. 45). — Amer. Drugg., Feb. 10, 1900, 66.

FIG. 46.

FIG. 47.



Prescription Labels.

Prescription Labels—A Novel Form.—F. Thanish has devised a form of

prescription label which is intended to preserve a copy of the prescription by a novel method. The label is perforated so as to leave a margin, the margin alone being gummed. The directions are written on the outer, ungummed side, the copy on the inner, gummed side. When attached to the vial, the label has the usual appearance, as shown by Fig. 46; if reference to the prescription is desired, the perforations are severed, when the label may be removed as shown by Fig. 47. The method possesses the further advantage over that of writing the copy on the outer side of the label, that the copy is protected from obliteration by handling or by a portion of the contents running down from the mouth of the bottle.—Pharm. Ztg., Aug. 9, 1899, 556.

Paper Shop Labels—Shellac Coating before Varnishing.—Joseph F. Hostelley remarks that it is often desirable to give paper labels on glass bottles and canisters a transparent coating, impervious to moisture, that will keep the labels free from finger prints and the blemishes of time. This can be nicely and satisfactorily done by first covering the label with a thin, even layer of shellac, then coating it with varnish. The writer has tried several ideas for coating paper labels with a permanent film, finally adopting the preceding method. The shellac dries very quickly and the varnish may be applied in a few minutes. Labels look well printed on pure white paper with a typewriter, with a heavy border ruled close to the edge in india ink. When applying the shellac to the label, flow it over the printing instead of brushing; this will prevent the ink from running. —Amer. Drugg., March 29, 1900, 202.

COMMINUTION.

Colored Glass Containers—Relative Efficiency of Different Colors in Resisting the Action of Light.—H. J. Möller records the results of experiments made after photographic methods in order to determine the relative efficiency of different colored glass containers in protecting their contents from the action of the chemical rays of light. Operating with such substances as silver bromide and chloride, iron, mercury, gold and uranium salts, he found the resistance of colored glass to be in the following order:

Strongly protective: black, red, orange, yellow, brown yellow, and pure green glass.

Somewhat protective: bluish, dark-green, violet and milky glass.

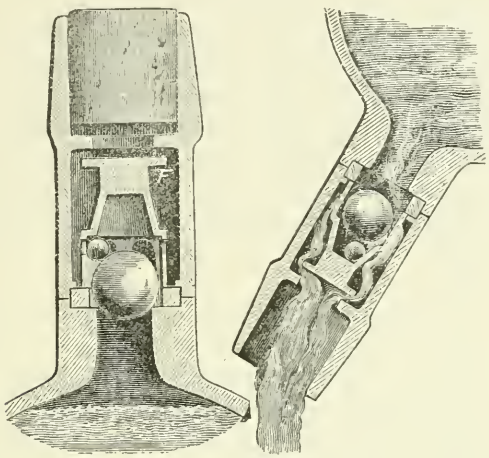
Non-protective: blue and colorless glass.

Many other substances, such as chlorophyll, pyrogallol, chlorine, nitroprusside of sodium, etc., are protected in colored glasses in the same order.—Apoth. Ztg., Sept. 23, 1899, 568; from Arch. Pharm. Org. Chem., 1899, 253.

Non-refillable Bottle—A Practical Device.—Joseph Goodman has patented a device which is designed to prevent refilling bottles into the necks

of which it has been inserted after originally filing them. The illustrations (Fig. 48) are sectional side elevations, showing the bottle upright, and tilted for pouring out its contents. Suitable provision is made so that

FIG. 48.

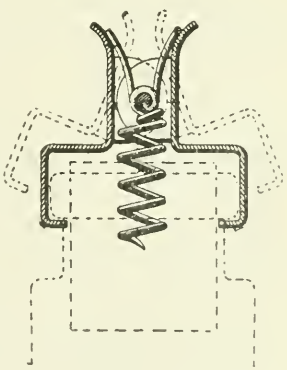


Non-refillable Bottles.

the ball cannot be lifted and the liquid then poured into the interior of the bottle.—Merck's Rep., May 1900, 213; from Scient. Amer., lxxxii., 212.

Bottle Stopper and Extractor—A Useful Device.—C. V. B. Reeder has invented the device shown by Fig. 49, the object of which is to provide a simple and effective stopper retainer and extractor. It will hold the stopper or cork with which it is connected in the bottle by means of spring-jaws which engage the annular lip of the bottle. The cut shows the action of the device clearly, the dotted lines indicating the position of the jaws when the cork is about to be extracted. — Merck's Rep., July, 1899, 312.

FIG. 49.



Bottle Stopper and Extractor.

Corks — Saturation with Caoutchouc. — According to a process patented in Berlin corks are saturated with caoutchouc by the following method: The caoutchouc is dissolved in 19 parts of benzin (benzol (?) Rep.). The corks are placed into this solution, and by means of a compression pump, are subjected to a pressure of 10 to 12 atmospheres, so that the fluid may uniformly penetrate into the cork substance. They are then exposed to the air until the odor of the solvent is completely removed.—Apoth. Ztg., July 19, 1899, 428.

Holder for Bottle-Sponge—A Convenient Device.—Joseph F. Hostelley describes the simple device shown by Fig. 50 for cleaning the deep interiors of large graduates, jars, etc. It consists of a round piece of hard wood, ½ inch in diameter and 18 inches long, well sand-papered, and halved with a common saw, a distance of five inches of its length. A thin brass embroidery ring, the inner measurement of which is ⅝ inch, is passed over the opposite end. The "jaws" formed by the passage of the saw are parted, and a small damp sponge forced between, after which the ring is firmly pressed down to securely hold down the sponge as in a vice. The hole depicted in the uppermost end is to suspend the device from a nail in the wall.—Drugg. Circ., Dec., 1899, 281.

FIG. 50.

Holder for Bottle-Sponge.

Soap Cutter—Convenient Construction.—F. N. Strickland finds a soap cutter constructed as follows preferable to a wire: To a piece of smoothly planed board, 18 inches long, 6 inches wide and 2 inches thick, nail another piece of board of the same thickness, but 4 inches wide and 8 inches high, to the further right-hand edge. Now place the edge of a long, thin-bladed butcher knife (one having a sharp point) upon the plank and prick the point of it into the middle of the upright piece of wood. Remove the knife, and where the point entered the wood, or just above it, drive in a small wire nail bent in the shape of a letter "U." This prevents the knife wearing out too large a place in the board, aud gives a better fulcrum. The cutter is now ready for use. Stick the point of the knife into the wood and under the nail just driven, raise the handle up, and slide under the bar of soap. Push down the knife handle, on the principle of a lever, at the same time pushing gently in to prevent the knife slipping out, and the soap is easily and quickly cut into cakes of any desired thickness.—Drugg. Circ., June, 1900, 116.

"Latent" Finger Marks—Forensic Method of Recognition.—Not very long ago Renée Forgeot discovered a method by which it becomes possible to render visible certain latent traces remaining after contact of the human hand or foot upon ordinary or wall paper, the floor or other objects. The method consists in passing a glass roller evenly coated with (printer's ? Rep.) ink over the surface, when the previously invisible traces are distinctly revealed. In the case of latent traces on the floor, a solution of silver nitrate may be used in place of ink, and in those of glass objects, the vapors of hydrofluoric acid or of osmic acid are employed. Anton Traut observes that he found it preferable to apply the ink by means of a flat hair-pencil, which distributes the ink more evenly and gives a more distinct development of the imprint; a darker tint upon a lighter ground

of the same color. He has since, however, discovered a far more convenient method for discovering these traces upon paper. This consists in exposing the paper to the vapor of iodine, obtained by heating a few granules of iodine in a beaker covered with a glass plate, to about 70° on a water-bath, and then sliding the paper beneath the plate. On exposure to the iodine vapor for a short time, the imprint left by the hand or foot becomes distinctly visible and the papillary lines are clearly defined. If then the paper is moistened by means of a soft sponge with distilled water, the yellow color of the impression is changed to light blue with the starch contained in the paper, and becomes permanent. The value of such investigations becomes evident when it is remembered that the human papillary lines are almost unchangeable by the advance of age, but invariably are different in individuals.—Pharm. Post., Sept. 10, 1899, 487–488.

B. Preparations.

General Subjects.

A Formulary of Non-official Preparations has been published by the Society of Apothecaries of Dresden (Saxony) and vicinity, comprising a great diversity of preparations, among them a number of formulas with which American pharmacists are quite familiar, while others are evidently the outcome of local demand and practice. These have been as far as seemed useful embodied in the present report, and may be found under their proper heading. They embrace medicated waters, salves, plasters, solutions, pills, powders, troches, syrups, tinctures, wines, etc., and form a very respectable addition to the modern physician's list of remedial agents.

Official Preparations—Examinations.—In a report to the N. Y. State Pharmaceutical Convention at the annual meeting in 1899, the Committee on Adulterations, who had confined their investigations to pharmaceutical and chemical preparations obtained from pharmacies only, in different localities in the State, make the gratifying statement that the results tend to show that the pharmacists of the State, as a class, show an earnest desire to comply with the food and drug law. While in a few instances they have been found lacking and not sufficiently careful in keeping up to the standard, this is the exception, and existing conditions are in vivid contrast to the extraordinary statements printed in glaring headlines in the public press. The Committee has examined many liquid and solid galenical preparations, such as syrups, elixirs, tinctures, ointments, simple and compound powders, and numerous pharmaceutical chemicals. Many samples of the official preparations collected came up to the required standard of the U. S. P., and while others were found inferior, willful substitutions and adulterations in the sense of the food and drug law were few, and these

rather attributable to carelessness or ignorance than intent. Moreover, the factor of deterioration, to which some of the preparations are inevitably subject even after short keeping, must not be lost sight of in passing judgment. For the detailed statements concerning a large number of the preparations and chemicals examined, the original reports may be consulted in Proc. N. Y. State Pharm. Assoc., 1899, 61–70.

Commercial Pharmaceuticals—Examination.—David L. Davoll, Jr., gives the results of examination of a number of commercial pharmaceuticals, chemicals and drugs.

Syrupus Ferri Iodidi, in three examples, was found to contain 9.35, 9.28, and 9.20 per cent. of ferrous iodide, instead of the officially required 10 per cent.

Tinctura Iodi, in eight examples, showed only 49.71, 60.5, 91.46, 86, 46, 75, and 74.57 per cent. of the required quantity of iodine, which is 7 Gm. in 100 Cc., some containing methyl alcohol as solvent.

Spiritus Ætheris Nitrosi, in four examples, showed the presence of 2.60, 2.45, 2.03, and 1.90 per cent. of ethyl nitrite.

Extractum Belladonnæ Foliorum Alcoholicum, in two examples, was found in the one case to differ in its deportment to such solvents as alcohol, chloroform and water from the other. In duplicate assays of each the one was found to contain 2.20 and 2.187, the other 2.94 and 2.97 per cent. of alkaloid.

Oleum Olivæ, in four examples, was found to be cotton seed oil, pure and simple, and in a fifth, a mixture of equal parts of green olive oil and cotton-seed oil.

Potassii Bitartras, in three examples, was found to conform to the U. S. P. requirements in every respect; in a fourth it was adulterated to the extent of 52 per cent.

Magnesia, in one example, conformed to the pharmacopœial requirements; two others gave pronounced effervescence and lost on ignition 19 and 20.32 per cent. respectively.

Mel, in two examples, was found pure; a third was practically glucose, with scarcely an attempt to simulate the sensible properties of honey.

Coccus, in only one example, which was very suspicious looking, was found to be loaded with barium sulphate amounting to 68 per cent.—Proceed. Ill. Pharm. Assoc., 1899, 54–56.

Galenicals and Chemicals—Examination Covering a Large Field.—Dr. William J. Robinson, having made it a practice while engaged as a proprietor in the drug business to carefully examine his stock, and then acquire an appetite and inclination for testing the preparations of the drug-shop, has, during the last six months, analyzed over four hundred specimens of chemicals and galenicals, covering almost every important

article of the U. S. P., besides a number of non-official ones. The specimens analyzed were either bought in the open market, or brought to him by students from the different drug stores in which they were employed; many were obtained on a physician's prescription, and about fifty or sixty were purchased directly from various wholesale houses. As to the locality, by far the greater number of specimens came from the territory in Greater New York; a few from up the state, and also from New Jersey and Connecticut. From the results of these investigations, which are given in detail, the author arrives at the following conclusions:

1. That many of the drugs, chemicals and prescriptions sold and dispensed in our drug stores are of very inferior quality, and sometimes absolutely worthless.

2. That the chief causes of the inferiority of the drugs are: Careless manufacture; careless keeping; keeping too long, and failure to renew the stock, no matter how old the drug may be; and, to a certain extent, cheap wholesale houses, who care more for cheapness than for quality.

3. That cases of willful substitution and adulteration, though they do exist without any doubt, are comparatively few and far between.

4. That in cases of delicate chemicals, it is advisable to specify a reliable manufacturer's name.

5. That while the majority of druggists are fairly conscientious and careful about the quality and quantity of goods they dispense, there are a few —for the sake of the pharmaceutical profession, let us hope a very few— who are totally unscrupulous as to what they sell or dispense, and even speak of it with a cynicism which is simply appalling. — Drugg. Circ., Nov., 1899, 253-256.

Artificial Foods—Review of their Purposes, Composition, &c.—J. Percy Remington contributes an interesting paper in which he discusses, in a practical manner, the subject of artificial foods, touching upon the reasons for their existence, the principles of their use, the composition and manufacture of the various kinds, and the great possibilities which are open to this comparatively new form of nourishment which is now occupying so much of the attention of the medical men and scientists of the world. So far artificial foods have found their greatest use as a substitute for human milk in infant feeding, since in the diseases of adults there are many forms of diet which can be employed in such cases, and artificial food has therefore not yet found as extensive an application as in the field of infant feeding. Nevertheless, much has been written upon the subject by authorities all over the world, and it is the author's endeavor to review and present the vital points concerning the best methods of artificial feeding, and the various physiological phenomena which take place in the human organism, dividing his subject into convenient classes, as follows: *predigested foods*, *milk foods*, *cereals* and *complete foods*. After discussing their composition and utility in the light of the laws laid down as the result of

practical experience by the authorities on the subject, he arrives at the conclusion that these artificial foods are all more or less useful, but that they all possess certain definite defects. It follows that the problem of artificial feeding has not yet been completely solved, though it becomes clear when we glance through the best pharmaceutical and medical literature of to-day that science and art are combining their forces and exerting the greatest activity in the attempt to solve this problem. Proc. Penna. Pharm. Assoc., 1899, 63–70; Amer. Journ. Pharm., Aug., 1899, 383–392.

Pharmaceutical Chemicals and Solutions—Practical Observations.—Frank P. Kirby points out a number of chemicals and solutions of chemicals which the pharmacist should and can prepare profitably at odd times, and makes some practical observations concerning their preparation. They include scale salts of iron, solution of ferric chloride, the salicylates, benzoates, citrated caffeine, tartar emetic, washed and precipitated sulphur, solution of subacetate of lead, &c. These, and many others that might be mentioned, require no special apparatus, and their preparation affords a good practice.—Bull. Pharm., July, 1899, 279, 280.

ACETA.

Acetum Convallariæ—Formula.—The Association of Dresden Apothecaries has adopted among other unofficial formulas the following for a Vinegar of Lily of the Valley: 10 parts of the finely cut-up flowers are macerated for eight days in a mixture of 10 parts of alcohol, 18 parts of diluted acetic acid and 72 parts of water, expressed and filtered. The product is a clear yellowish liquid, having an acid and somewhat bitter taste.—Apoth. Ztg., April 4, 1900, 225.

Oxycratum Compositum—Formula of the Dresden Apothecaries' Society.—Prepared by adding 5 parts of spirit of camphor to 95 parts of simple oxycratum.

Oxycratum Simplex is prepared by dissolving 20 parts of ammonium chloride in 500 parts of vinegar and 470 parts of water.—Apoth. Ztg., April 11, 1900, 242.

AQUÆ.

Medicated Waters—Revision of the Official Process of Preparation.—A. G. Criddle and W. O. Richtmann have made an extensive series of experments, undertaken with the object of determining the respective merits of the processes hitherto and now in use for preparing medicated waters. They observe that a change in the method of preparation in the U. S. P. does not necessarily indicate an advancement, which has been well demonstrated in the case of the aromatic waters of the last revision. The advantages that filtration through precipitated calcium phosphate was supposed to have over other substances used for the same purpose have not been established. On the contrary, the method has proven to be inferior

to several of the older methods, notably in the increased weight of material to be used in order to effect the solution of the oil, and in the liability of the product to spoil on standing—fungous growths being found practically in all the waters prepared with calcium phosphate. The authors' conclusions are based on a long series of experiments, the results of which are exhibited in numerous tables, made: (1) with calcium phosphate, U. S. P., 1890; (2) with magnesium carbonate; (3) with cotton, U. S. P., 1880; (4) with magnesium silicate—talcum—using twice as much as if calcium phosphate were used; (5) cold water agitation; (6) distillation of water vapor through cotton impregnated with volatile oil; (7) with kieselguhr, the same as with talcum. All the evidence obtained by these investigations is in favor of the readoption of one of the older methods, namely that of 1880, which consists in impregnating cotton with the oil and filtering water through it. The waters are easier and more rapidly prepared, retain their strength and quality of odor longer, do not become turbid, do not suffer from fungous growths, contain practically no foreign matter, and are not incompatible with substances with which they are most frequently combined. In this connection the extent to which the various substances employed are dissolved in distilled water filtered through each substance, as though an aromatic water was being prepared, was studied. In duplicate experiments, 1000 Cc. of water from kieselguhr left 1.041 and 1.045 Gm. residue; from magnesium carbonate, 0.110 and 0.130 Gm.; from calcium phosphate, 0.235 and 0.260 Gm.; and from talcum, 0.060 and 0.061 Gm. Testing these waters with silver nitrate, ferrous sulphate, copper sulphate, zinc sulphate, cocaine hydrochloride, atropine sulphate, and boric acid, it was found that no precipitates were produced in the waters prepared by simple agitation with water, by the cotton process, or by the processes in which kieselguhr or talcum were used; but the waters prepared with calcium phosphate or magnesium carbonate yielded precipitates with several of the reagents named—the first with silver nitrate and the sulphates, the latter with the sulphates alone — while the alkaloidal salts or boric acid affected none of the waters obtained by the different processes.—Pharm. Archives, Feb., 1900, 21–30.

The preceding paper is followed by a bibliography of Aromatic Waters, compiled by W. O. Richtmann, giving a brief synopsis of the contents of all the papers, so far as they have become available to him, that have been contributed on the subject since the beginning of the nineteenth century. —Ibid., Feb. to June, 1900, 31–40, 48–60, 69–80, 95–100 and 110–120.

Medicated Waters — Preference to Magnesium Carbonate for their Preparation.—Thos. W. Murphy finds that magnesium carbonate will render medicated waters clear with more ease and certainty than will precipitated calcium phosphate, no matter how much greater the quantity of the latter be used than that prescribed by the Pharmacopœia. Magnesium carbonate is to be preferred also for the same reasons for making aromatic elixir.—Merck's Rep., Aug., 1899, 349.

Medicated Waters—Unofficial Formulas of the Dresden Apothecaries' Association:

Aqua Carminativa: Oil of roman chamomile, 10 drops; oil of lemon, oil of crisped mint, oil of caraway, oil of coriander, oil of fennel, of each 5 drops; alcohol, 100 Gm.; water, 900 Gm. A clear, colorless liquid.

Aqua Carminativa Regia: Powdered cochineal, 10; alum, 5; sugar, 1000; aq. carminativa, prepared as above, 3000; spirit of mellisa, 1000 parts. Digest during 8 days and filter.

Aqua Cosmetica "Kummerfeld:" Camphor, 1; gum arabic, 2; milk of sulphur, 10 parts. Triturate these to extreme fineness with 5 parts of glycerin and 82 parts of rose water.

Aqua Matico: Volatile oil of matico, 1 part, is shaken with 2000 parts of warm distilled water, and the liquid filtered after cooling.

Aqua Ophthalmica "Conrad:" Dissolve 1 part zinc sulphate in 296 parts distilled water, and 3 parts of tincture of opium containing saffron (tr. opii crocata, Ph. Ger.).—Apoth. Ztg., April 4, 1900, 225.

Bitter Almond Water—Improved Method of Distillation.—S. Siebert observes that when bitter almond water is prepared in conformity with the Ph. Germ., by distillation over direct flame or with superheated steam, products of decomposition are invariably formed which determine turbidity and eventually the formation of precipitates in the distillate. He avoids this by effecting the distillation with steam under ordinary pressure as follows: 5 p. of bitter almonds, well deprived of fixed oil by pressure, are finely pulverized, mixed with 1 p. of *beechwood-sawdust*, previously sifted from coarse particles, and the mixture, moistened with 1½ p. water, is then introduced into the still, upon the sieve-bottom usually provided in the tin-stills of German pharmacies. The distillation is then effected, and proceeds regularly by admitting steam beneath the sieve-bottom—the alcohol, officially required, having previously been placed into the still and beneath the sieve. The yield is about 9 p. of official strength.—Pharm. Centralh., Jan. 25, 1900, 47.

Cherry Laurel Water—Decomposition on Keeping.—L. van Itallie calls attention to a peculiar decomposition observed in a lot of cherry laurel water distilled in 1897, and preserved with the customary care in bottles placed in the cellar. When examined in 1898 the water had become turbid, though its odor was normal. On distillation a colorless distillate was at first obtained, which was miscible with water to form a clear solution; but after a time a distillate passed over of a yellow color, and was no longer completely soluble in water, small quantities of crystalline substances passing from the condenser at the same time. The colorless clear distillate, after keeping for several weeks in the cellar, had again become turbid, a small quantity of oily drops and a dirty yellow-brown resin separating on the surface. The quantity of this substance was too small for analysis, but

its general character inclines him to the view that it is mainly composed of a derivative of the benzaldehyde, namely, "benzimid," traces of "benzoinimid" being also formed. The original water contained an excessive quantitity of hydrocyanic acid. In the water redistilled after a year's keeping this still was higher than officially (Pharm. Nederlandica) required, but it was largely in combination with ammonia, only 0.1074 parts being in the free state out of 1.0206 parts of cyanogen in 1000 parts. On keeping this from November 1898 to May 1899 in three bottles, each under different conditions, the total cyanogen was reduced to 0.864, 0.772 and 0.367 per 1000, while the amount of benzaldehyde was reduced from 5.705 to 4.975, 5.245 and 3.352 per 1000 in the same order.—Apoth. Ztg., July 5, 1899, 399.

Camphor Water—Convenient Preparation.—Prof. A. B. Stevens observes that a supply of camphor water may always be kept on hand by keeping a stock bottle filled with distilled water, the surface of which is covered with coarsely powdered camphor. When the shelf bottle needs replenishing, filter from the stock bottle into the shelf bottle, and refill the stock bottle with distilled water.—Amer. Drugg., Dec. 26, 1899, 355.

Bromoform Water—Remedial Value.—According to A. Mathieu and A. Richaud, bromoform water deserves more extended therapeutic use than has hitherto been practiced. It is said to be very useful for internal pains, nausea and similar affections, particularly in the case of tuberculous diseases. Bromoform is stated to be soluble in about 300 to 350 parts of water, and may be used in the same manner and in the same cases as chloroform water.—Apoth. Ztg., March 24, 1900, 203.

Chlorine Water—Alternative Formula Wanted.—Francis Hemm suggests that a simple and rapid process for the extemporaneous preparation of chlorine water would be much appreciated by the dispensing pharmacist. The present official process, while yielding a good and pure preparation, is out of question with the prescriptionist. Why not make it from potassium chlorate, hydrochloric acid and distilled water? This yields a fairly strong solution, can be made in short order, and is claimed not to be therapeutically objectionable. The following equation explains the reaction: $2KClO_3 + 6HCl = 2KCl + Cl_2O_4 + Cl_2 + 2HCl = 2H_2O$.—Amer. Drugg., March 29, 1900, 199.

Oxygenated Carbonic Acid Water—Preparation.—After various attempts during several years to produce a palatable oxygenated water, Dr. N. Wender succeeded in preparing a satisfactory beverage by the aid of carbonic acid. The necessary salts having been dissolved in the water, it is charged with carbonic acid under a pressure of 4 atmospheres, then with oxygen until a pressure of 8 atmospheres is attained, when it is filled into bottles under a pressure of 6 atmospheres. The water so obtained is perfectly clear and possesses a pleasant, refreshing and mild taste. When a

bottle of the water is opened, oxygen escapes and may be identified by means of a glowing splinter of wood. Both the carbonic acid and the oxygen suitable for this purpose are obtainable in the compressed state. —Apoth. Ztg., Oct. 18, 1899, 623 ; from Ztschr. f. d. ges. Kohlensäure- Ind., 1899, 482.

Artificial Mineral Waters—Hints Concerning their Manufacture.—Thomas Warwick contributes an excellent paper in which he points out how artificial mineral waters can be made which he considers equal to the natural articles. He quotes extensively from a work on " Beverages " by C. H. Sulz (Schulz ? Rep), giving a number of formulæ in which the sequence of the ingredients is arranged in the order of groups, the members of each group consisting of salts which are compatible with each other, so that they may be dissolved together and their solutions filtered before the addition of the filtered solutions of salts of the next group. The paper will be found useful by pharmacists who desire to manufacture artificial mineral waters for dispensing at the soda fountain.—Bull. Pharm., July, 1899, 273–276.

Bitter Waters—Comparison of Purgative Saline Contents.—The following table, exhibiting the relative quantity of purgative saline constituents in some of the popular European bitter waters is given in Pharm. Centralh., Nov. 2, 1899, 670 :

Water, One Liter.	Analyst.	Sodium Sulphate, Gm.	Magnesium Sulphate, Gm.	Magnesium Chloride, Gm.	Total Purgative Salts Gm.
Friedrichshall.....	Bauer	13.01	—	8.12	21.13
Ofen (Buda)	Molnár	19 81	19.50	—	39.31
Tulna.....	Struve	16.12	12 12	—	28.24
Saidschitz	"	3.06	10.93	0.21	14.10
Scharatiza. Spring No. 1....	Gawalowski	29.40	28.00	—	57.40
" " " 2–4 .	"	11.36	24.94	—	36.30
" Mixture 1–4..	"	18.71	20.66	—	39.42

The last mentioned, the so-called

Scharatiza Bitter Water, has been in the market since 1896, being the product of four springs near the town of Scharatiz, in Moravia. The mixed water has the sp. gr. 1.033, and contains 42.27 Gm. of solid constituents in the liter, composed as follows : Sodium sulphate, 17.82 ; magnesium sulphate, 23.37 ; calcium sulphate, 0.81 ; sodium chloride, 0.14 ; magnesium bicarbonate, 0.12 ; silicic acid, 0.01 ; small quantities of lithium and strontium sulphate, traces of organic substances, and free carbonic acid. Gawalowski's figures above given were obtained in a sample bottled in 1899.—Ibid, 681.

CAPSULÆ.

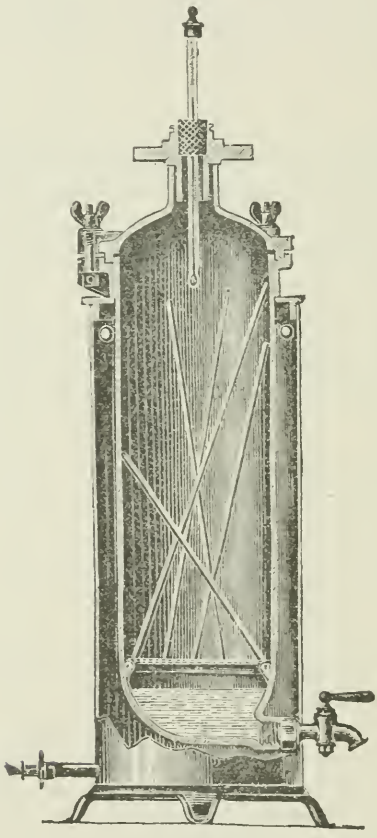
Elastic Capsules—Preservation.—G. Pohl observes that elastic gelatin capsules are extremely sensitive to dust, which injures their appearance, and cannot therefore be preserved, as is sometimes recommended, in wood-wool. Containing glycerin, they are liable to absorb moisture and assume a dull appearance; they should therefore be stored in a dry locality, preferably in a heated room. When they have become dulled by exposure to moisture, they are readily restored to their original brightness by placing them in a dry, warm room.—Pharm. Post, Sept. 3, 1899, 478.

CARBASUS.

Antiseptic Bandages—Pharmaceutical Recognition.—The question of admitting the bandaging materials more generally supplied by manufacturers into the German Pharmacopœia, with the view of establishing for these important products official standards and tests, has been the subject of several important papers in recent years in which their admission is unqualifiedly advocated on the ground that, as in the case of drugs and galenical or chemical preparations in general, the pharmacist is and must be held responsible for their composition and quality. Under present conditions, these products enter into commerce and use uncontrolled by any official requirement whatsoever, in consequence of which the products under the name title vary widely in their composition, even when the attempt and intent is to secure good quality. These points have been discussed admirably, in so far as the German Pharmacopœia is concerned, by Prof. Beckurts at the 69th Annual Meeting of German Naturalists and Physicians in 1898, and subsequently, in greater detail, by Dr. Salzmann in its relation to the Medical Department of the German Army. The approaching revision of the Codex has now elicited discussion in the same direction in France, a notable paper being that of E. Debuchy dealing particularly with antiseptic gauzes. He holds that the preparation of antiseptic bandages is a function that belongs to the domain of the practical pharmacist, and that the Codex should therefore include specific formulas and methods for their preparation, so that uniform products may be obtained and controlled. The necessity for this becomes apparent when we consider the variations in the formulas that have been proposed and are in use for preparing carbolic guaze, for instance. Thus Lister demands a gauze containing 4 per cent. of phenol, Habard requires 6.2, Münnich 4.5, Dieterich 2.2, Billroth 6.6, Fillenbaum 5, Doux 15, Bruns 6.3, Yvon 9, England 10, and the supplement of the French Codex 9.4 per cent.: variations, therefore, between 2.2 and 15 per cent. Of the 10 formulas in use, 8 require the impregnation of the gauze with a certain addition of resin, 2 the addition of castor oil, 7 direct alcohol as solvent for carbolic acid, 3 recommend the use of paraffin, 5 of gly-

cerin, and others even direct a certain amount of stearin. The important points to be considered in connection with official formulas for antiseptic gauzes and other bandaging material are: 1. The quality of the fabric itself, the density of the woof, its weight, breadth, etc. 2. The kind of antiseptic to be employed and the quantity to be used. 3. The manipuation. The most suitable material for antiseptic guaze, in the opinion of

Fig. 51.



Sterilizer.

the author, is a gauze 70 Cm. in width, having a woof of 10 x 11 threads to the square Cm., such being commercially designated under the figures $\frac{4}{4}$. A meter of this material weighs about 25 grammes. It must be pure white and free from all sizing or other foreign addition. As a precautionary measure it should be carefully purified by subjecting it to treatment, after the manner recommended by Thomas, with chlorinated lime, hydrochloric acid, and subsequent profuse washing with water. After purifica-

tion the gauze should not give a blue color with iodine, yield nothing to water that may react with chemical reagents, and should be strongly absorbent. Before impregnating the so prepared gauze with the antiseptic material, it should be sterilized.—Apoth. Ztg., Jan. 20, 1900, 46–48.

Bandages and Gauzes—Convenient Sterilizer.—Philip Ludwig recommends the sterilizer shown by Fig. 51 for conveniently sterilizing bandages and gauzes in small pharmacies, which is supplied by E. A. Lentz, Berlin, who constructs it after specifications of Prof. Max Schüller. It consists of a cast-iron enameled cylindrical vessel, 420 Mm. high and 100 Mm. in diameter, provided beneath with a steam-tight cock for the withdrawal of water, and above with an enameled cast iron cover with a central opening for the admission of a safety-valve into which a thermometer is fastened by means of a sound cork. The cover fits into a groove, by means of which a steam-tight joint is effected, a length of twine of suitable thickness being placed into the groove before screwing down the lid by the aid of the thumb-screws shown. The safety valve consists of an accurately fitted piece, which acts by its own weight, and the addition of weights, having a central opening so as to slip over the thermometer, for increasing the pressure, three such weights or rings being provided By their aid it is possible to produce pressures under which the temperature in the sterilizer reaches 102°, 105°, 107°, 109° and 110°, before steam will escape from the safety valve, and by a suitable adjustment of the flame—either gas or alcohol—the desired temperature is easily maintained, for the required time—say ¾ or 1 hour. The cylinder, as is shown, fits into a jacket provided beneath with a gas burner for supplying the necessary heat. The interior of the cylinder is provided at a short distance above the bottom with a perforated shelf for the reception of the cylindrical cans or other suitable receptacles for the bandages, gauzes, instruments, &c., that are to be sterilized, this shelf being conveniently removed and replaced by the aid of rods attached to it.—Pharm. Ztg., Jan. 20, 1900, 53.

Antiseptic Gauzes—Formulas.— E. Debuchy employs the following formulas for the preparation of antiseptic gauzes, which keep well and supple if preserved in air-tight containers:

Carbolic Acid Gauze: Phenol, 255; alcohol (90 per cent.), 1,500; glycerin, 20; purified gauze, 1,000. This gauze will contain 20 per cent. of phenol.

Iodoform Gauze: Purified gauze, 2,500; glycerin, 50; ether, 3,000; iodoform, 283 or 637, according as a 10 or 20 per cent. gauze is required. Ether alone is found to give better results as a menstruum than the mixture of ether and alcohol generally used; the drying is more rapid, hence the exposure to the air is reduced to a minimum. This gauze should be dried in a dark place and so preserved—air tight, of course.—Pharm. Journ., Feb. 24, 1900, 171; from Journ. de Pharm. (6), *11*, 1.

Iodoform Lint—Alteration by Keeping.—P. Rouvet has observed that

iodoform lint undergoes alteration after keeping. On opening a packet an odor of putrefying organic matter was observed; the oiled parchment paper in which it was wrapped had a dark brown tint and was specked with small brilliant white crystals. By micro-chemical and ordinary reactions these crystals were found to consist of iodide of zinc, showing that the iodoform had been reduced, as they were the result of the iodoform vapor, or hydriodic acid, on the galvanized iron case in which the lint had been packed. The oiled parchment paper was also connected with the alteration, and the author recommends that paraffined paper should be substituted in future.—Chem. News, Aug. 18, 1899, 83; from Journ. de Pharm. (6) ix, No. 4.

CATAPLASMÆ.

Poultices--A Substitute.—M. I. Wilbert, calling attention to a mixture of kaolin and glycerin which has been placed on the market under the trade name of "Antiphlogistine," communicates the following formula, which produces a similar and quite as efficient preparation: Kaolin, glycerin, each 1000; boric acid, 100; oil of peppermint, oil of wintergreen, each 2; oil of eucalyptus, 2 parts. The kaolin, passed through a No. 60 sieve, is heated for an hour or more at 100° C. to sterilize it: the glycerin is then added, and the heat continued for thirty to forty minutes, stirring until a smooth, creamy mixture is obtained. When nearly cold, the boric acid and oils are added, and after thorough mixture the compound is preserved in tin or glass, fairly tight, so that the absorption of moisture from the air may be avoided. Kaolin free from iron should be employed, though the presence of a trace of iron will probably not affect the efficiency of the product, which is apparently a useful addition to local medicaments.—Am. Jour. Pharm., Oct. 1899, 478–479.

Wood Pulp Poultice—A Substitute for Flaxseed.—Frederick T. Gordon, an apothecary in the U. S. Navy, calls attention to the value of wood pulp sheets as a substitute for flaxseed in poultices, for making splints, ice-caps, and the like. In his experience, which is doubtless extensive, wood pulp comes very near being an ideal substanee for making poultices. It will absorb and hold from four to five times its weight of water, and the resultant poultice may be applied directly to the parts without the intervention of cloths. No cooking, no stirring and spreading on cloth are needed; just a soaking in hot water, but be sure and soak the pulp enough at the start. When the poultice has become too cool, it may be wrung out and again soaked in hot water, the same poultice serving for a number of days even in inexperienced hands. The wood pulp sheets are doubtless obtainable from any wood pulp mills. The author's supply came from the paper mills at Manayunk, Philadelphia, Pa. Preference should be given to the so-called "unbleached pulp," since the "sulphite pulp" sometimes contains traces of sulphites and other bleaching chemicals. Thick sheets of

wood pulp may be used to make *splints*. If soaked sufficiently to soften them, they can be moulded to fit any limb or surface; or, a thin layer of plaster of paris may be sprinkled between two thin sheets—or a thick sheet split—and an excellent *plaster support* obtained. An *ice cap* may be made by soaking the wood pulp in ice water, mould to shape the head, apply, and renew as with hot poultices. The material is readily sterilized by placing it into a hot stove a few minutes. In cases of *pneumonia* the usual jacket poultice is most efficiently upheld by one of wood pulp, using at least an inch in thickness and covering with oiled silk.—Am. Jour. Pharm., Nov., 1899, 525–529.

CERATA ET UNGUENTA.

Ointments—Preparation.—Alfred I. Cohn makes some practical observations on the care requisite in the preparation of ointments. Purity of ingredients and their proper preservation from change are of paramount importance. The author gives explicit directions for preparing lard from the abdominal fat of the hog, and considers that such only should be used when lard is required. Suggestions are also made concerning the preparation of zinc ointment, benzoinated lard, cold cream, ointments containing extracts, veratrine ointment, ointments containing metallic compounds, such as ammoniated mercury, lead iodide, mercuric oxide, etc.—Merck's Rep., June, 1900, 242–243.

Ointments—Conditions Favoring their Utility.—Louis Kahlenberg communicates the results of a series of experiments undertaken in his laboratory with the object of inquiring into the nature of ointments and to ascertain the conditions most favorable for their utility. From the standpoint of therapeutics the action of the secretions of the affected parts to which ointments are applied comes, of course, into consideration. It would seem, however, that those ointments in which a certain degree of saponification of the base takes place would be more effective than those that are mere mechanical mixtures. If this be the case, the ointments made up with lard plus wax as the base are far superior to those in which vaseline is used; but lanolin is better as a base than either of these. Again, an ointment prepared at a high temperature is better than one prepared at room temperature, and it would be of interest therefore that the relative antiseptic properties of such ointments be investigated.—Pharm. Rev., April, 1900, 156–159.

Ointments.—Identification by Chemical Reaction.—Strobl has determined the chemical reactions which may serve for the identification of a large number of ointments as follows:

Ung. Paraffini—A faint rose-red to violet color is produced on addition of some tincture of iodine, sulphuric acid and iodine. With ether a turbid solution is formed from which the addition of a few drops of alco-

hol separates the paraffin, whilst with more alcohol a hard mass is formed. If the same chemical agents are applied to

Lard, a rose-red, brown-red. brown, green and final grey color is developed. The lard is completely soluble in ether, and alcohol produces a precipitate only when it is added in large quantity. The same chemical reagents produce with a mixture of 5 parts of

Lanolin and olive oil a dark-red color, changing to grey-green, and finally to light-brown.

Ung. Boricum gives the reactions for boric acid.

Ung. Cerussæ gives a light-yellow color with potassium iodide and a black-grey color with potassium sulphide.

Ung. Potassii Iodidi produces a light yellow color with lead acetate.

Ung. Acidi Carbolici assumes a dirty-green color with ferric chloride, changing, on addition of wat r, to violet. The phenol odor aids in the id ntification.

Ung. Tartari Stibiati becomes red-yellow on addition of potassium sulphide.

Ung. Veratrini gives a green-yellow color with sulphuric acid, changing to brown-red and finally to red. It incites sneezing.

Ung. Glycerini (glycerite of starch, Rep.), assumes a dark-blue color with tincture of iodine. It has a sweetish taste.

Ung. Plumbi Tannici gives a blue-black color with ferric chloride, and a light yellow color with potassium iodide.

Ung. Diachylon Hebra is colored light yellow with potassium iodide, while potassium sulphide produces a brown color, changing to black.

Ung. Sulphuratum.—If a little of the salve is heated with water on a silver coin, it produces a black spot upon the metal.

Ung. Elemi gives with nitric and nitrous acids a dirty, yellow-red color, developing a strong odor of elemi at the same time; it burns with a strongly sooty flame.

Ung. Basilicum yields with nitric and nitrous acids a soft, egg-yellow nitrification product.

Ung. Ichthyoli produces a blue-violet color with sulphuric acid. Ammonia is developed on heating the ointment strongly with sodium carbonate, and the residue of the reaction when heated with silver blackens this metal.

Ung. Neapolitanum (Mercurial Ointment, Rep.).—If the salve is warmed with nitro-hydrochloric acid and a drop of the strongly diluted aqueous solution is placed upon a copper coin, an amalgam forms on the surface of the metal.

Ung. Præcipitati Albi produces a black color either with sulphuric acid

or stannous chloride. Potassium dichromate manifests no appreciable change.

Ung. Zinci remains nearly white with potassium sulphide, while hydrochloric acid and potassium dichromate when heated with the ointment color the entire mass green.—Pharm. Post, Aug. 6, 1899, 427–428; from Ztschr. f. Analyt. Ch., 1899.

Unguentum Leniens, Ph. Germ. III.—Manipulation.—J. Loos observes that it is difficult to understand why there should be so much diversity of opinion both as to the composition and method of preparing rose-water ointment. Following the formula of the Ph. Germ. III., accurately, an ointment of unquestionable quality is obtained by manipulating as follows: The wax and spermaceti are melted with one-half the prescribed quantity of oil and strained through gauze, thinly covered with cotton-wool, into an enameled dish. The remainder of the oil is then added, and mixed with a *warmed* pestle, observing that a *clear* mixture is formed. The *whole* of the water, also warmed, is then added, and, if turbidity ensues, heat is carefully applied to render the mixture perfectly clear. This is now assiduously stirred until cold, the salve set aside in a cool place (the cellar) over night, again thoroughly stirred, and the oil of rose lastly incorporated. Manipulating in this way, the water is perfectly combined and the "cold cream" remains homogeneous.—Pharm. Ztg., July 22, 1899, 515.

Referring to the foregoing, George Birnbaum agrees with Mr. Loos that the formula of the Ph. Germ., III. will yield a perfectly satisfactory ointment, but not that the circumstantial manipulation described is necessary. He recommends that the wax, spermaceti and oil be melted on a water-bath, poured into a very large mortar, and allowed to stand during 24 hours. Then, having scraped the fat-mixture from the sides of the mortar, it is thoroughly triturated with a pestle, and the water gradually incorporated; the trituration is then continued to a foamy condition, which requires a short time only.—Ibid, July 26, 1899, 528.

Ointments.—Formulæ of the Dresden Apothecaries' Society:

Unguentum Acidi Borici "Credé."—Boric acid, in fine powder, 1: benzoinated lard, freshly prepared, 9 parts.

Unguentum Anglicum Album.—White wax, 15: spermaceti, 15: almond oil, 70 parts. In winter use 90 parts of almond oil.

Unguentum Argenti Colloidalis "Credé."—Colloidal silver, triturated with a little water, 15; yellow wax, 7; lard, 78; benzoated ether, 2 parts.

Unguentum Diachylon cum Vaselino.—Lard plaster, 5: yellow vaselin, 4 parts; liquid paraffin, 1 part

Unguentum Hamburgense.—Cocoa butter, 1 part; almond oil, 2 parts.

Unguentum Hydrargyi Oxydati Pultiformis "*Dr. Schanz.*"—Freshly precipitated yellow oxide of mercury, in form of magma, 1 part; distilled water, 10 parts; wool fat, 10 parts; white American vaselin, 79 parts. To be protected from light.

Unguentum Iodoformi.—Iodoform, 1 part; American vaselin, 9 parts.

Unguentum Picis Liquidæ.—Wood tar, 1; lard, 2 parts.

Unguentum Wilsonii.—"Wilson's Ointment." Finely pulverized zinc oxide, 1; benzoinated lard, 4 parts.

Vaselinum Camphoratum.—Solid paraffin, 60; liquid paraffin, 100; camphor, 40 parts.

Vaselinum Carbolisatum.—Pure carbolic acid, 3 parts; yellow vaselin, 97 parts.

Vaselinum Salicylatum.—Salicylic acid, in fine powder, 2 parts; yellow vaselin, 98 parts.—Apoth. Ztg., April 25, 1900, 277.

Carbonate of Zinc Cream—Formula.—Herbert Skinner recommends a cream prepared with pure zinc carbonate as being preferable to creams prepared with commercial calamine, which is often a far from desirable application to an inflamed epidermis. It is prepared by mixing equal parts of zinc carbonate and glycerin to a smooth paste, then this with an equal quantity of a separately prepared mixture of equal parts of hydrous wool fat and glycerite of starch. Obviously, the proportion of zinc carbonate may be increased or decreased as may be desirable.—Pharm. Journ., June 9, 1900, 616: from Brit. Journ. Dermat., May, 1900.

Zinc Ointment—Rapid Preparation.—A. B. Burrows states that the difficulty in making a smooth zinc ointment is overcome if a paste is made with the zinc oxide and an equal weight of water, and, after incorporating with this a certain proportion of wool fat, triturating or stirring in enough white petrolatum, either cold or heated to a little above its congealing point, to make the proper quantity of ointment. The proportions, in the U. S. P. strength, would be as follows: Zinc oxide, 20 parts; water, 20 parts; wool fat, 10 parts: white petrolatum, 50 parts. The latter is best triturated in cold.—Merck's Rep., March, 1900, 101.

Mercurial Ointment—Recovery of Mercury from Rancid Samples.—Dr. Russwurm observes that when rancid mercurial ointment is heated above its melting point, the mercury separates in the form of a pasty mass, from which the greater part of the liquefied fat may be decanted without difficulty. If then the pasty mass, which consists of a compound of fatty acids and mercury with some uncombined fat, is boiled with an excess of a 5 per cent. solution of sodium hydrate, the mercury will quickly separate in the metallic and liquid state, and is then easily recovered in a pure condition by washing, drying with blotting paper, and filtration.—Phar. Centralh., 1899, 516.

Mercurial Ointment — Detection of Added Coloring Substances. — D. van Schoor recommends the following method for the detection of the artificial coloring of mercurial ointment: About 10 Gm. of the ointment are boiled in a capsule with 50 Gm. of a 10 per cent. solution of magnesium sulphate; the mercury is separated by means of a separatory funnel

and heated to dryness over the naked flame. The adulterant remains as residue (? Rep.).—Pharm. Post, Dec. 10, 1899, 692.

Ointment of Colloidal Mercury—Formula.—Dr. Oscar Werler gives the following practical formula for preparing an ointment of colloidal mercury: Colloidal mercury, distilled water, of each, 10.0; lard, 60.0; white wax, 15.0; ether, 1.5; benzoated ether, 3.5, The ointment base having been prepared with the lard and wax, the colloidal mercury is dissolved in the *cold* water, and intimately mixed with the base (also cold? Rep.), avoiding all unnecessary trituration, until the ointment has a uniform blackish-gray color. The ether and benzoated ether are then incorporated, thus adding to the stability of the preparation, improving its odor, and aiding the intimate admixture of the components and the rapid absorption of the ointment by the skin.—Pharm. Centralh., Oct. 5, 1899, 609.

Unguentum Hydrargyri Oxydati flavi pultiformis—Synonymous Names.—The editor of the "Pharm. Ztg." (Aug. 2, 1899, 541), calls attention to the fact that under the name Ung. Hydrarg. Oxid. pultiform, 1 per cent., 2 per cent., etc., an ointment prepared from freshly precipitated yellow oxide of mercury, in form of magma, is understood. The precise title as proposed by Dr. Schweissinger, is "Unguent. Hydrarg. Oxyd. flav. pultiform:" but the ointment is also prescribed under the title "Ungt. ophthalmic Schanz," "Ungt. Hydrar. Oxid. Flav. recenter parat. seu pultiform," and, simply, as "Unguent. luteum."

Ointment of Mercuric Nitrate—Proposed Preparation with Petroleum as a Base. Francis Hemm suggests unless the elaidin resulting from the reaction between the nitric acid and lard is considered essential, that the ointment of mercuric nitrate be prepared hereafter by mixing the official solution of mercuric nitrate with petrolatum in the proper proportion.—Amer. Drugg., Mar. 29, 1900, 199.

Copper Ointments—Formulas for Glandular Enlargements.—Hoppe some time ago recommended an ointment composed of 1 part of black oxide of copper and 10 parts of lard for the treatment of glandular enlargements. Mosler now recommends cupric oxide 2 parts, to vaselin 14 parts, and Lutos has found an ointment prepared with 15 grains of neutral cupric acetate to 1 or 3 ounces of lard to be serviceable in cases of scrofulous glands.—Pharm. Journ., April 7, 1900, 364; from Therap. Gaz., (3), 16, 31.

Tar Ointment—Preparation with Paraffin.—Herbert Skinner mentions that tar ointment, prepared by melting 2 parts of paraffin, then stirring in 5 parts of pine tar until cold, has been found a very efficient substitute for the official (B. P.) tar ointment in his experience as pharmacist to the Great Northern Central Hospital.—Pharm. Journ., June 9, 1900, 617; from Brit. Journ. Derm., May, 1900.

Unguentum Conii, B. P.—Liability to Mould, and Prevention.—E. W. Lucas states that conium ointment, B. P., if kept for a short time, exhibits a luxuriant growth of mould. Boric acid does not altogether prevent this. The author suggests either the addition of two drops of clove oil to each ounce, or a basis composed of equal parts of wool-fat and soft paraffin. The latter is to be preferred, the conium juice showing no tendency to come out again after standing, as it does in the official preparation. In regard to

Unguentum Hamamelidis, B. P., the author observes that this is unsatisfactory when prepared entirely with wool-fat as a basis, and recommends the replacement of one-third of it by soft paraffin as an improvement. Furthermore, the liquid extract of *dry* hamamelis leaves does not represent the full medicinal value of the drug, and he therefore suggests this modification:

Liquid extract of hamamelis	¼ fl. oz.
Distilled extract of fresh hamamelis	¼ fl. oz.
Anhydrous wool-fat	1½ oz.
Soft paraffin	1 oz.

Mix.

—Chem. & Drugg., Dec. 9, 1899, 959.

Lip Salve — Improved Formula. — The following improved formula for lip salve is recommended in "Bull. gener de Ther." (July 1899): Paraffin, 80.0; vaselin, 80.0; alcanin, 0.5; olei bergamott., 1.0; olei citri, 1.0. Melt on the water bath. This cerate never becomes rancid, and retains its handsome red color indefinitely.—Apoth. Ztg., July 15, 1899, 420.

Gonorrhœa Ointment—Formula.—The "Bull. Gen. de Therap." gives the following formula for an effective gonorrhœa ointment: Cocoa butter, 100: yellow wax, 2 to 6; silver nitrate, 5; balsam of Peru, 2. Mix. To be used on a metal sound. Four applications, it is stated, are often sufficient to effect a cure. Pharm. Jour., March 3, 1900, 229.

Cooling Salves (Pastes).—Composition.—Dr. P. G. Unna gives a number of formulas for cooling salves or pastes, which are typical of three classes into which they may be divided. The first class are obtained by embodying from 20 to 25 per cent. of dusting powder with a fatty body and a maximum quantity of water. Such a paste is, for instance, the

Zinc Oxide—Sulphur—Kieselguhr Paste, which the author has used advantageously for a long time. Its composition is as follows: Zinc oxide, sulphur, of each 1.50; kieselguhr, rapeseed oil, of each 10.0: wool fat, 20.0: distilled water, 30.0 Gm. The powders may also be added to a corresponding quantity of cold cream, or a

Cold Cream Cooling Salve may be made by adding to 10 Gm. either 2.5 Gm. of magnesium carbonate or 5 Gm. of starch.

A second class contemplate the use of vaselin as the fatty basis with a

maximum quantity of water. For this purpose the following formula may be employed: Magnesium carbonate, 2.5 Gm.; distilled water, 5.0 Gm. Mix and add vaselin, 5.0 Gm. Kieselguhr may here be substituted for magnesium carbonate, but the resulting paste is coarse grained and not recommended.

A third class has for a base the well-known lime liniment, to which the proper consistence is given by the addition of zinc and chalk. This the author names

Pasta Zinci Mollis, which may be prepared of different proportions of ingredients, as follows:

	I.	II.	III.
Oleum lini	20	25	20
Aqua calcis	20	25	20
Zinci oxidum	30	25	40
Creta præp.	30	25	20

—Apoth. Ztg., Jan. 6, 1900, 14; from Monats. f. prakt. Derm. 1900, 1.

Zinc Pastes—Various Formulas of the Dresden Apothecaries' Society: *Pasta Zinci* is prepared from crude zinc oxide, 25; wheat starch, 25; yellow vaselin, 50 parts.

Pasta Zinci Salicylata (*Lassar's White Paste*) is prepared like the foregoing, adding 2 parts of finely powdered salicylic acid in lieu of 1 part each of zinc oxide and wheat starch.

Pasta Zinci Sulfurata (*Sulphur Paste*), is prepared from: Crude zinc oxide, milk of sulphur, calcined kieselguhr (infusorial earth), wool fat, each 10 parts; rapeseed oil, 20 parts; distilled water, 40 parts.

Pasta Zinci Sulfurata Saccharata—Formula.—Menahem Hodarn, of Constantinople, recommends a paste (salve) made according to the following formula, on account of its drying and healing qualities in certain skin diseases: Lanolin, vaselin (yellow), sugar (white), oxide of zinc, of each 2 parts; sulphur (washed), glycerin, of each 1 part.—Pharm. Centralh., July 20, 1899, 446; from Monatsh. f. prakt. Derm., 1899, No. 9.

Mollplaste—A New Form of Plaster-Salve—Dr. Karl Dieterich has introduced a new form of salves which combines the advantages of plasters and ointments without the disadvantage of these by themselves. He calls these plaster-salves (salbenpflaster) "Mollplaste," a name which is protected, while the process for the preparation of the basis is also protected by a German patent, and is described as follows: A mixture of gelatin with 5 to 10 per cent. of boric acid and an adequate quantity of water is heated in close vessels under a pressure of 7 atmospheres during 48 hours. This results in an antiseptic gelatin-mass, which remains liquid, and when mixed with an equal quantity of the hard plaster masses commonly employed, constitutes the basis for the different medicated forms of "Mollplaste." These are produced by the further addition of lanolin, hydro-

carbons, resins, glycerides, cauotchouc, gutta percha, glycerin, and the desired medicinal agents in the proportions in which they are now employed in ordinary plaster masses; the product being finished by final heating of all the ingredients in the autoclave to a temperature of 150°–160° C., and stirring the resultant mass until cold. In this way a soft, sterile, very adhesive plaster-salve is obtained, which is conveniently dispensed in collapsible tubes, and readily spread upon linen or muslin fabrics as required.—Pharm. Ztg., June, 28, 1900, 482.

Unguentum Domesticum — A New Ointment Base.—Dr. P. G. Unna recommends a new ointment base, prepared by mixing 20 parts of yolk of eggs with 30 parts of almond (or peanut) oil, which he designates as "unguentum domesticum." The emulsifying properties of the egg-yolk make this ointment base particularly useful for balsams, tars, ichthyol and substances of a kindred nature, the mixture obtained forming smooth salves with other fats and taking up considerable water without interfering with their homogeneity. The addition of 1 per cent. of balsam of Peru is recommended as a preservative. But while the new ointment base serves excellently for the exhibition of balsam of Peru, oil of cade, storax, tar, liantral, ichthyol, talc, starch, sulphur, camphor, solution of lead subacetate, lime water, vinegar, corrosive sublimate, etc., certain other substances are excluded more or less completely. Among the substances that cannot be combined with it are the phenols—carbolic and salicylic acid, pyrogallol, resorcin; the tannins, most of the metallic oxides and their salts, such as zinc, mercury, bismuth, etc. So many of the substances are mentioned as being incompatible, that the usefulness of the new base will probably be confined to the class of substances mentioned initially.—Apoth. Ztg., Oct. 28, 1899, 646; from Montash. f. pr. Derm., 1899, 375.

Unguentum Pomadinum Aromaticum—A Pomade Base for Diseases of the Scalp.—In the search for a suitable basis for applying medicinal agents, such as sulphur, resorcin, cantharidin, antiseptics, etc., to the scalp., P. G. Unna has found the following formula:

Tinct. aromatica, 20.0; ung. cerei (cera alba parat.), 80.0.

To avoid anointment of the hair, he combines this with about 20 per cent. of gelanth., according to the following formula:

Tinct. aromatica, 20.0; gelanth., 20.0; ung. cerei (cera alba parat.), 60.0.

The addition of gelanth. causes the pomade to form a dry covering on the scalp, after which the hair may be washed with soap and water without disturbing the coating so produced. But, inasmuch as this treatment removes the fat naturally in the hair, it becomes necessary to make a further application, namely, a "brilliantine," composed of

Glycerin, 10.0; lemon juice, 10.0; cologne water, 80.0.

This is applied either by the aid of the comb or brush, a few drops being

sufficient.—Apoth. Ztg., July 5, 1899, 400; from Monatsh. f. prakt. Derm., 1899, 633.

Pomades for Falling Hair—Formulas.—The "Bull. Comm." (27, 326) gives the following formulas for pomades for falling hair:

1. Beef marrow, 20; castor oil, 10; gallic acid, 1. Melt together.

2. Beef marrow, 20: sweet almond oil, 10; quinine sulphate, 2; balsam of Peru, 1.

Lipogenin—A New Ointment Base.—N. Kromer has investigated the composition of a new ointment base which has recently been introduced into medicinal use under the name of "Lipogenium solidum," while an oily form of it has been introduced as "Lipogenium liquidum." The former is a solid odorless mass, of distinctly crystalline texture, and though having the appearance of porcelain, it melts instantaneously at the temperature of the body. The liquid preparation is oily, colorless, neutral, and odorless, and deposits at low temperatures large crystalline leaflets, which again dissolve on heating. On analysis these bodies are shown to be mixtures in variable proportions of esters of palmitic and iso-oleic acids. The melting point of the solid body is at 28° C., the congealing point at 27.5° C. The liquid body solidifies at 16° C. and melts again at 17.5° C. They are soluble in chloroform, ether, 95 per cent. alcohol, and miscible with fixed oils; insoluble in water and in glycerin, and are good solvents for iodine.—Apoth. Ztg., Aug. 30, 1899, 520; from Ztschr. Öst. Apoth. Ver., 1899, 517.

Adeps Lanæ—Criticism of B. P. Tests.—Operating upon one of the best brands of Adeps Lanæ on the market, W. Elborne found its melting point to be 38° C. (uncorr.), and its sp. gr., compared with water at the same temperature to be 0.913 at 45° C. 50 Cc. of the melted fat yielded a clear solution with 100 Cc. of ether sp. gr. 0.720 when heated to boiling, but the solution becomes turbid on cooling, and after the lapse of four hours deposited a sediment occupying one-half the volume, the supernatant portion being bright and clear. This conflicts with the statement of the B. P., which describes it as "readily soluble in ether," since it requires heat to secure and maintain a clear solution. When a solution of wool-fat in chloroform—in which it is very soluble—is poured gently on the surface of sulphuric acid, it produces, as described in the B. P., a purple red color in the chloroformic solution; but if the procedure is reversed, and the sulphuric acid slowly poured into the chloroform solution in equal volume, a second characteristic and delicate reaction is produced. The lower acid layer assumes within two or three minutes a beautiful green fluorescence by reflected light. This also manifests itself with chloroformic solutions of mixtures of adeps lanæ with other ointment bases, its intensity being proportioned to the amount of adeps lanæ present. The chloroformic layer assumes a blood-red color by transmitted light, best seen at the juncture of the two liquids. Wool-fat forms a clear solution in ten

times its volume of light petroleum (b. p. 60° C.), when the mixture is heated to 20° C.; but on cooling becomes cloudy at 15° C., and ultimately affords an abundant sediment. Dried wool, direct from the fleece, yields to such hot light petroleum 31 per cent. of fat.—Pharm. Journ., July 8, 1899, 26.

Petrolatum—Value as an Ointment Base in Southern Climates.—In an interesting paper on "Petroleum in Pharmacy," read at the meeting of the Alabama Pharmaceutical Association in 1899, L. S. Brigham extols the value of petrolatum as a substitute for lard, and of paraffin as a substitute for wax in ointments, these being particularly adapted to southern climates. He thinks that the pharmacopœial recognition of two kinds of petrolatum—hard and soft—has retarded the general use of the petroleum ointment bases. This double standard has confused pharmacists who ordinarily have only the soft kind, and has hindered the confidence leading to its general adoption. He therefore advises a return to the single standard of 1880, with suitable definition of its consistency and quality, and authority for more extended use in ointment making.—Proc. Alabama Pharm. Assoc., 1899, 29–32.

Solidified Petroleum—A New Ointment Base.—A. Conrady, to meet a demand for a petroleum ointment base that will permit the incorporation of water and, while of emollient consistency, does not melt at moderate temperatures, suggests the following method of preparation: Common soap is dissolved in hot water, the solution allowed to cool, and a cold solution of an aluminum salt, preferably commercial aluminum sulphate, is added under constant stirring. The fine precipitate of aluminum oleate so produced is washed by decantation and finally on a filter, and dried completely at a gentle heat. The product is a nearly white powder, having the texture of talcum, which when mixed under gentle heating with from 10 to 30 per cent. of petroleum (? Rep.) forms an ointment base of more or less solid consistence, having the properties initially mentioned.—Apoth. Ztg., Dec. 20, 1899, 767.

Ointment Slab — Cheap and Convenient Construction. — E. G. Eberle finds it convenient to have an ointment slab fitted into a shallow drawer in the prescription case. Take two pieces of double-thick glass, paint one side of each with asphaltum varnish, place the varnished sides together, thus cementing it into one plate. Line the bottom of the drawer with putty and set the glass plate into this, having it thoroughly smooth, level and flush with the sides of the drawer. This will furnish an ointment slab, always in place, easily cleaned, being of glass, and a dark background, which is an advantage, as most powders to be rubbed up into ointments are white, and rough particles can be easily detected. If it is desired to have a rough surface, place some camphor, oil of turpentine and emery on the slab and rub the mixture briskly over the surface of the

glass until the desired roughness is obtained. A block of wood is the best thing to use in rubbing the emery over the glass.—Drugg. Circ., Jan., 1900, 11.

COLLODION.

Collodion—Official Characters and Inefficiency as a Test for Carbolic Acid in Creosote.—Following the U. S. P. formula for preparing collodion strictly—using ether of the sp. gr. 0.7266 at 15° C., and alcohol of the sp. gr. 0.818 at 15° C., F. A. Sieker obtained a slightly turbid, viscid liquid. The sp. gr. of the collodion so obtained was found to be 0.7681 at 15° C. On spontaneous evaporation, 3.899 per cent. of residue was obtained, which on heating to 65° C. for a few hours was reduced to 3.76 per cent. Theoretically about 3.86 per cent. of residue might be expected. Two commercial specimens examined by the author had the sp. gr. 0.8138 and left 5.02 per cent. of residue in the first sample, and the sp. gr. 0.7970 and a residue of 4.63 per cent. in the second sample. The first sample, judging by both sp. gr. and odor, was evidently deficient in ether, and this deficiency was also in the second sample, though less marked. Collodion being used as a test for determining carbolic acid in creosote, the author applied this test with the three collodions described on mixtures consisting of 3 volumes of creosote and 1 volume of carbolic acid. Neither the collodion prepared strictly by the pharmacopœial formula, nor the second of the commercial collodions produced the expected coagulation, but the collodion having the higher sp. gr. (0.8138) was readily coagulated by the creosote-carbolic acid mixture under the conditions of the official test. The test seems therefore unreliable in determining the presence of carbolic acid in creosote unless it is present in considerable quantity.—Pharm. Review, Sept., 1899, 377–398.

Collodium Flexile—Improved Formula—Wm. T. Caldwell observes that the collodium flexile of the U. S. P. is still too contractile, and suggests the following formula:

Glycerin	2 parts.
Venice Turpentine	5 "
Lard	10 "
Collodion	83 "

The Venice turpentine and lard give elasticity, while the glycerin gives it suppleness. The author also suggests the use of a little glycerin in the formula for

Styptic Collodion—About 20 per cent. of tannic acid is rubbed up with glycerin, and the alcohol, ether and collodion are then added. — Pharm. Era, Nov. 16, 1899, 667.

Crystallin — A New Form of Collodion. — Thibault recommends as a superior substitute for ordinary collodion a solution of 5 p. of pyroxylin,

in 20 p. of methyl alcohol and 20 p. of amyl acetate. He gives the name "crystallin" to the new preparation, and claims for it the advantages over ordinary collodion that it evaporates slower and produces a less friable film.—Apoth. Ztg., Jan. 27, 1900, 64; from Bull. de Pharm. der Sud-Est, 1899, 656.

Collodium Acetonatum—Formula of the Dresden Apothecaries' Society.—Collodion cotton, 4 parts, are dissolved in acetone, 96 parts.

Collodium Corrosivum, is made by dissolving 1 part of mercuric chloride in 60 parts of collodion:

Collodium Iodoforminatum, by dissolving 1 part of iodoform in 9 parts of collodion;

Collodium Salicylatum, by dissolving 1 part of salicylic acid in 9 parts collodion; and

Collodium Salicylatum Viatorium Viride, by dissolving 1 part of extract of Indian hemp and 10 parts of salicylic acid in 89 parts of collodion.—Apoth. Ztg., April 4, 1900, 225.

Oxide of Zinc Collodion—Formula.—Bomfried recommends the following formula for oxide of zinc collodion: Zinc oxide, 1; Canada balsam, 2; collodion, 17 parts.—Pharm. Centralh., Oct. 26, 1899, 665; from L'Univ. Pharm.

Paraform Collodion—Preparation and Uses.—Unna recommends a mixture of collodion with 5 per cent. solution of paraformaldehyde as cautery in the treatment of small, mild, isolated epidermal swellings. The formaldehyde causes the drying-in of the swelling.—Pharm. Centralh., April 5, 1900, 209.

Paraform Collodion—A New Remedy for Warts.—Meuse recommends a solution of trioxymethylene, commonly known under the name of "paraform," as an effective cautery for the removal of warts. He directs:

Trioxymethylene, 3.0; collodion, 27.0.

The remedy is applied with a pencil thrice daily, and is usually effective in from two to four days.—Apoth. Ztg., July 5, 1899, 400.

Corn Killer—Good Formula.—C. R. Meredith, claiming no originality for the following formula, recommends it as producing a very effective "Corn Killer:" Gun cotton, 200 grs.; ether, 12½ ozs.; alcohol, 3½ ozs.; salicylic acid, 2 ozs.; zinc chloride, 1 oz.; ext. cannabis ind., ½ oz.—Proc. North Dakota Pharm. Assoc., 1899, 45.

COLLYRIA.

Eye Waters—Objection to Use of Salicylic Acid as a Preservative.—Robt. S. McKinney has made experiments concerning the proposed addition of salicylic acid to eye waters as a preservative, and draws the following conclusions: First, that the addition of the acid makes the solution more irritating to the eye; secondly, that the solution will keep for a

reasonable time without it, if it has been carefully prepared; and thirdly, that solutions made with the addition of acid have developed flocculæ, when those made without it (solution of cocaine, for instance) have shown no change.—Proc. Maryland Pharm. Assoc., 1899, 100.

ELIXIRES.

Elixirs—Defects in the Formulas of the N. F.—William A. Dawson, in view of the possible introduction of "a line of elixirs" into the forthcoming Pharmacopœia, protests against accepting the formulas of the National Formulary unquestioned. He says: "Elixirs were devised solely and simply as a more elegant and palatable method of administering medicines; but for a collection of mawkish and downright nasty-tasting elixirs, commend me to the N. F. elixirs." The elixirs of the house that first generally introduced them to the medical profession are still the leading elixirs of the market, because they are the most palatable. With few exceptions the entire line is made with one simple elixir, namely, an orange elixir, a pure clean flavor that no matter how disagreeable the medicament is, will leave a pleasant after-taste in the mouth. For some years the author has made

Simple Elixir after the following modification of the U. S. P. formula: Tincture of sweet orange peel, 50 Cc.; deodorized alcohol, 200 Cc.; syrup, 375 Cc.; precip. calcium phosphate, 15 Gm.; water, enough to make 1000 Cc. The official

Tincture of Sweet Orange Peel is made by the author in the following manner: Into a tared porcelain mortar or capsule, place 500 Cc. of deodorized alcohol. Lay a coarse grater across the top of the mortar, and grate off the yellow, oil-bearing rind of enough oranges to obtain 200 Gm. of peel. When this is done, wash off the grater by pouring over it 200 cubic centimeters of the remaining alcohol, allowing the washings to drain into the mortar. Then transfer to a percolator, returning the liquid to percolator until the tincture runs through clear and bright and percolate to 1,000 Cc. with deodorized alcohol. The oranges should be carefully selected—clear, bright skins without spot or blemish. Russet oranges won't do. The large sized, deep-colored "Messina Naval" oranges are to be preferred. Florida and California fruit give as fine a flavor, but are deficient in color, although that is of minor importance. It will take from six to a dozen oranges to obtain 200 Gm. of rind, according to the size of the fruit.—Amer. Drugg., Mar 10, 1900, 129.

Elixirs—Formulas of the Philadelphia Hospital.—The following formulas for elixirs have been adopted in the recently revised edition of the "Pharmacopœia of the Philadelphia Hospital":

Elixir Acetanilidi: Acetanilid, 0.15 Gm.; spt. ammon. aromatic, 1 Cc.; tr. card. comp., 1 Cc.; alcohol, 1 Cc.; elixir of orange, enough to make 4 Cc. Dose, one teaspoonful.

Elixir Ferri, Quininæ et Strychninæ: Iron pyrophosph., 0.13 Gm.; quinine hydrochlor. 0.065 Gm.; strychnine sulphate, 0.001 Gm.; glycerin. 0.6 Cc.; syrup, 1.2 Cc.; elixir of orange, enough to make 4 Cc. Dose, one to two teaspoonfuls.

Elixir Glonoini: Solution of nitroglycerin (1 per cent.), 0.06 Cc.; elixir of orange, enough to make 4 Cc. Dose, one to two teaspoonfuls.

Elixir Potassii Arsenitis: Sol. potass. arsenite, containing $\frac{1}{50}$ gr. arsenous acid in 2 minims, and made with potassium bicarbonate, 0.12 Cc.; tr. card. comp., 0.3 Cc.; elixir of orange, enough to make 4 Cc. Dose, one to two teaspoonfuls.

Elixir Strychninæ Arsenatis: Strychnine arsenate, 0.001 Gm.; elixir of orange, 4 Cc. Dose: One to two teaspoonfuls.—Amer. Journ. Pharm., March 1900, 131.

Elixir of Terpin Hydrate—Formula.—Ferdinand A. Sieker observes that an elixir of terpin hydrate containing 1 grain in each fluid drachm cannot be prepared so as to hold this amount in solution when the usual formulas that have appeared in print are followed. In these, either aromatic elixir alone or aromatic elixir with alcohol and glycerin, basing his formula on the composition of a commercial sample of elixir, which was not flavored, he offers the following, which has proven satisfactory: Dissolve 17.5 Gm. of terpin hydrate in 400 Cc. of alcohol, by the aid of a gentle heat if desirable, add 400 Cc. of glycerin, and then enough distilled water to make 1000 Cc. At the ordinary temperature this elixir will hold the terpin hydrate indefinitely in solution. At low temperatures some will crystallize out, but is quickly redissolved by warming.—Pharm. Review, July 1899, 307.

Elixir of Terpin Hydrate and Codeine—Förmula.—Herman Harms recommends the following formula for preparing an elixir of terpin hydrate and codeine, from which, in distinction from the products of many of the published formulas, the terpin hydrate does not separate: Terpin hydrate, 2 oz. av. 2½ dr.; saccharin, 16 grains; alcohol, 3 pints; glycerin, 1 pint. Mix, dissolve by aid of heat, and add codeine sulphate, 128 grains; aromatic elixir, 4 pints. After standing 24 hours, filter through white paper. Crystals will separate when the elixir is exposed to 55° F. The saccharin modifies the acrid taste of the terpin hydrate.—Amer. Drugg., Feb. 26, 1900, 96.

Elixir Absinthii Compositum (Stoughton's Elixir)—*Formula of Dresden Apothecaries' Society.*—This is a tincture prepared with diluted alcohol, 1000; absinthium, 40; gentian, 25; orange peel, 20; rhubarb, 15; cascarilla, 5; and aloes, 5 parts.—Apoth. Ztg., April 4, 1900, 225.

"Vermuth"—Composition and Preparation.—According to a U. S. Consular Report (1899, *60* (227), 599), the production of "Vermuth" in France is almost entirely confined to Marseilles. The ingredients em-

ployed in making an extract, which, when added to wine, forms the "Vermuth," are exemplified in the following formula: Alcohol, 90 per cent., 8 liters; coriander seed, 800 Gm.; Greek nuts, Peruvian bark, and sweet flag, each, 200 Gm.; wormwood, sharp, and Roman wormwood, each, 720 Gm.; sweet marjoram and yarrow, each, 180 gm.; rose leaves, clover, and Ceylon cinnamon, each, 100 Gm.; dittany and angelica seed, each, 50 Gm.; hyssop, 150 Gm. These are digested for eight days at 120° F., then warmed moderately over a slow fire for twelve hours, the solids removed by expression, and the liquid filtered. The extract so obtained is added to wine as desired, the alcoholic strength of the "Vermuth" so produced being from 15 to 17 per cent.—Amer. Jour. Pharm., May, 1900, 232.

Liqueurs—Various Formulas.—"A. R." communicates the following formulas for "liqueurs" in "Apotheker Zeitung" (Aug. 5, 1899, 469):

Kurfürstenwasser: Cinnamon, 45.0; nutmeg, cloves, of each 10.0; orange peel, lemon peel, of each 20.0; Roman chamomile, mellissa, lavender flowers, sweet basil, serpyllum, caraway, of each 15.0; rose leaves, 30.0; orris root, calamus, of each 7.5; cardamoms, 3.0 Digest during 24 hours with 5 kgm. alcohol and 2 kgm. water, and distill off 6 kilograms of liquid, to which add a solution of 2 kgm. sugar in 2 kgm. water.

Stomach-Liqueur (Magenlikör): Ginger, cloves, cinnamon, galanga, calamus, peppermint, zedoary, of each, 10.0; orange peel, 40.0; lemon peel (fresh), 20.0. Digest during 24 hours with 3.5 kgm. alcohol and 1.5 kgm. water, distill off 4 kgm of liquid, and add to this distillate a decoction of 40.0 immature oranges, 5.0 quassia and 5.0 gentian in 1 liter of water. To this mixture add finally a solution of 2 kgm. sugar in 1 kgm. water.

Stomach Bitters (Magen Bitter): Macerate for 8 days 30.0 each of immature oranges and orange peel, 7.5 each of cloves, cardamom, nutmeg, cinnamon and cascarilla, 15.0 each of cassia buds and ginger, and 22.5 calamus, in 4 kgm. alcohol and 2 kgm. water. Express, filter, add a solution of 1 kgm. sugar in 2 kgm. water, and finally color brown.

English Bitters (Englischer Bitter): Nutmeg, cloves, of each 4.0; gentian, unripe oranges, calamus, galanga, angelica (root), of each, 15.0; lemon peel (fresh), 100.0; orange peel, 50.0; quassia, 4.0. Macerate during 8 days with 4 kgm. alcohol and 2 kgm. water; express, allow to settle, filter, add a solution of 750.0 sugar in 2 kgm. water, and finally color brown.

Standard Blackberry Balsam—Formula.—C. R. Meredith recommends to the North Dakota Pharmaceutical Association the following formula for a standard blackberry balsam: Blackberry juice, 4 pints; catechu, 4 ozs.; cinnamon, 1 oz.; nutmeg, 1 oz.; coriander, 1 oz.; powd. opium, ¼ oz.; sugar, 2 lbs.; alcohol, 2½ pints; water, enough to make 1 gallon.

The drugs, in coarse powder, are macerated for a week in the juice and alcohol, the liquor filtered off, the sugar dissolved in the filtrate, and enough water is added to make 1 gallon.—Proc. North Dakota Pharm. Assoc., 1899, 45.

Egg-Cognac—Formulas.—The following practical formulas for egg-cognac (Eierkognak) are communicated by "A. R." in "Apotheker Zeitung" (Aug. 5, 1899, 469):

I. The yolks of 15 eggs, carefully freed from the albumen, are placed into a liter flask with 250 Cc. of German Benedictine (Helfenberger or Waldenburger make), and well shaken together. Good cognac brandy is then added in small portions, shaking after each addition, until the flask is completely filled. On standing from 8 to 14 days, the pleasant taste of the "liqueur" is fully developed.

II. The yolks of 20 eggs are triturated in a capacious vessel with 250 Gm. of finely powdered sugar; then carefully heated by placing in hot water, stirring constantly, so as to produce a salve-like mass, to which, on cooling, 500 Cc. of cognac are added in small portions at a time and under constant stirring.

EMPLASTRA.

Belladonna Plaster, B. P., 1898—Process of Assay. — H. J. Henderson proposes a process for the assay of the belladonna plaster of the B. P., 1898, which he has found to give very accurate results with this official product, though not applicable to belladonna plasters which have a rubber base. Five Gm. of the plaster are disintegrated by maceration with 25 Cc. of ether in a glass-stoppered separator; the disintegrated mass is shaken out, first with 5 Cc. of a mixture of 3 parts of glacial acetic acid and 2 parts of water, and then with 5 Cc. of diluted acetic acid, B. P. Diluted sulphuric acid is added to the acid liquids in slight excess, the lead sulphate collected in a filter, and washed until Mayer's reagent no longer gives a reaction — the washings being concentrated separately and added to the filtrate. The latter is now shaken out with an excess of ammonia and 10 Cc. chloroform, this being followed by shaking out with two more portions each of 5 Cc. of chloroform. The united chloroformic solutions are then shaken out thrice with 5 Cc. each of dilute hydrochloric acid, and the acid solution so obtained, after addition of excess of ammonia, is again shaken out with 10, 5 and 5 Cc. of chloroform. The chloroformic solutions of the alkaloid are then evaporated to constant weight at a temperature not exceeding 93° C. The residue so obtained should be beautifully white and crystalline.—Trans. Brit. Pharm., 1896, 354–356.

Belladonna Plaster, B. P.—Method of Extraction for the Assay.—F. C. J. Bird observes that the determination of the alkaloidal value of the belladonna plaster of the B. P. is an operation which presents some difficulty on account of the interference of the soap, resin and other ingredients which enter into its composition. With the object of remedying this

difficulty, such solvents as petroleum spirit, chloroform, etc., were at first tried by the author, but they failed to completely dissolve the plaster, and the attempt to wash out the alkaloids merely resulted in hopeless emulsification. Finally a mixture of glacial acetic acid and chloroform was found to be the most satisfactory solvent, only a small and negligible quantity of coloring and extractive matter remaining undissolved. The following is the process in detail: Belladonna plaster (B. P.), 15 Gm.; chloroform, 35 Cc.; glacial acetic acid, 5 Cc. Warm gently to dissolve, and add: Water, 40 Cc.; dilute sulphuric acid (1 in 12), 35 Cc. Again warm and pour on a 4-inch Buchner's filter connected with a vacuum of 8 to 10 inches of mercury. Remove the nearly dry cake of lead sulphate, break it up and warm with: Chloroform, 10 Cc.; diluted sulphuric acid, 5 Cc.; water, 10 Cc. Again filter, and transfer the mixed filtrate to a separator. Run off the chloroform (aiding its separation, if necessary, by warming), wash twice with: Dilute sulphuric acid, 1 Cc.; hot water, 4 Cc.; and return the washings to the aqueous portion. To the mixed aqueous liquids add: Chloroform, 20 Cc.; solution of ammonia, a decided excess. Warm gently, agitate, and further continue the process in accordance with the directions of the B. P. This method of extraction has been used by the author with satisfactory results for several months, and its accuracy has been verified by the analysis of samples of known composition.—Pharm. Journ., Aug. 5, 1899, 146–147; from the "Analyst."

Belladonna Plasters—Variation in Strength of the Commercial Spread Article.—Chas. Caspari, Jr., points out that the U. S. P. makes no requirement for alkaloidal content of belladonna root or leaf or of any preparation made from them. It is well known, however, that the commercial extracts of belladonna leaf vary considerably in alkaloidal content, variations of from 0.74 per cent. to 1.84 per cent. having been noted. Similarly the belladonna plasters, for which the manufacturers have adopted 0.35 per cent. as the standard from the leaf, show great variation, and must necessarily do so when made from extracts of the variable strengths noted. The author had found 13 different samples to vary from 0.08 to 0.450 per cent. Others have recorded similar results: Macfarlane, reporting on 48 samples, found from a trace to 0.468 per cent. of alkaloid; Carl Smith, in 11 samples, from 0.042 to 0.594 per cent. Convenient methods of assay being now known, the author suggests the introduction of such, not alone for the plaster, but for the drug—root and leaf—and galenical preparations, into the forthcoming Pharmacopœia.—Proc. Maryland Pharm. Assoc., 1899, 102–103.

Unofficial Plasters.—Formulas of the Dresden Apothecaries' Society:

Emplastrum Hydrargyri Compositum (*seu Saponatum*).—Melt together equal parts of mercury plaster and white soap plaster.

Emplastrum Lithargyri cum Resina Pini.—Melt together 4 parts of lead plaster and 1 part of pine resin.

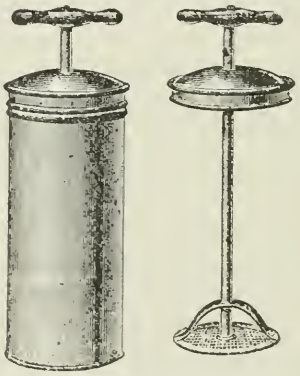
Emplastrum Saponatum Salicylatum.—Melt 85 parts of white soap plaster and 5 parts of yellow wax together on a water-bath, and stir 10 parts of finely powdered salicylic acid into the melted mixture.

Emplastrum Stomachale.—Lead plaster, 1000; white-lead plaster, 500; yellow wax, 150; pine resin, 150 parts. Melt these together and add: Camphor, 25; oil of wormwood, 2; oil of rosemary, 2; rectified oil of amber, 2: oil of lavender, 1; oil of caraway, 1; oil of calamus, 1, and oil of crisped mint, 1 part.—Apoth. Ztg., April 4, 1900, 225.

EMULSA.

Emulsifier—Simple and Efficient Construction.—Max Lehnert manufactures a simple and efficient apparatus for emulsifying oils, cold cream, etc., which is shown by the accompanying cuts (Fig. 52), and requires little explanation. It is constructed of heavy tinned iron, forming a deep

FIG. 52.



Emulsifier.

cylindrical vessel fitted with a substantial closely jointing lid, bearing through its center a perforated plunger. The material having been introduced—in case of cold cream or other salves in the melted condition—forcible up and downward movement of the plunger quickly effects emulsification. The plunger should be well tinned and soldered to prevent rusting.—Pharm. Centralh., Oct. 5, 1899, 607.

Emulsions—Determination of the Percentage of Oil.—Dr. A. Schneegans communicates the following accurate method for the determination of the quantity of oil in emulsions prepared with gum: 300 p. of the emulsion are evaporated with 50 p. each of coarse sand and kaolin, 50 p. of dried sodium sulphate being added towards the end of the operation, and the evaporation completed to dryness under occasional stirring. The residue is powdered, transferred to an extraction apparatus, extracted with ether, the ether evaporated, and the residual oil weighed. In the

case of emulsions of oil prepared with egg-yellow, simple shaking out with ether can be resorted to after having heated the emulsion for a short time to 100° in a flask for the purpose of coagulating the albumen. Accuracy, however, demands that the fat and lecithin of the egg-yellow, which are also taken up by the ether, should be taken into account. This on the average amounts to 6 Gm. (per cent.) in the egg-yolk.—Pharm. Post, Dec. 10, 1899, 692.

Cod Liver Oil Emulsions — Practical Observations.—Prof. H. V. Arny gave an interesting talk on Cod Liver Oil Emulsions before the Ohio Pharmaceutical Association, in which he particularly discusses the proposed agents and methods for expediting the production of acceptable preparations. That process which is in greatest favor by druggists generally is one by which emulsification is effected by simple agitation of the oil and emulsifier in a flask. A commercial emulsifier for this purpose, used in the quantity of 30 grains to an ounce each of oil and water, has been analyzed by Prof. Arny, who finds it to contain saccharin, saponin and some gummy body, either tragacanth or Irish moss jelly. He has prepared a powder composed of powd. tragacanth, 1.0 Gm.; saponin, 0.65 Gm.; saccharin, 0.015 Gm., which is an efficient emulsifier if used in the proportion of 15 grains to an ounce each of the oil and water. But, after all, the most desirable way of making emulsions is one which depends on the use of the mortar and pestle, and the best is one in which both acacia and Irish moss are used, as originally suggested by Bedford (see Proceedings, 1892, 432). A formula on these lines, given by a Cleveland friend, begins with a continental emulsion of acacia, 1½ ozs.; oil, 6 fl. ozs.; water, 3 fl. ozs. To this is added 18 fl. ozs. of a decoction of chondrus, prepared from 248 grs. of chondrus and a quart of water, and to this mixture oil and water are added under constant trituration, until one-half gallon of a 50 per cent. emulsion results. The product is beautifully white, and remarkably limpid, while its keeping properties are excellent, especially when fortified with alcohol, as suggested by the National Formulary. The formula for

Irish Moss Emulsion of Cod Liver Oil, as given in the N. F., has never given satisfaction in Prof Arny's hands, but that of the N. F. formula for

Egg Emulsion of Cod Liver Oil yields a splendid preparation, which is both beautiful and palatable. He obtains, however, better results than with egg yolk with the following formula for a

Glycerin Emulsion of Cod Liver Oil: Cod liver oil, 1 fl. oz.; glycerin, 2½ fl. dr.; syrup, 1½ fl. dr.; brandy, 2½ fl. dr.; water, enough to make 2 fl. ozs. The oil is added to the glycerin gradually with constant trituration until emulsified; the other ingredients are then added in the order given. Flavor with vanilla.

Malt Emulsions of Cod Liver Oil possess the advantage that extracts of malt cover the taste of cod liver oil better than any other substance yet

tried. The following formula yields a permanent emulsion—save an aqueous layer amounting to about 3 per cent. of the entire volume—cod liver oil, 4 parts; syrup of wild cherry, 2 parts; extract of malt, 1 part; sherry wine, 1 part. Emulsify the oil by the gradual addition to the malt extract, alternating with the syrup, and lastly add the wine. The malt extract must be neutral. It is liable to become a trifle acid, and this interferes with its emulsifying property. The trouble is removed by the addition of a trace of sodium bicarbonate.—Proc. Ohio Pharm. Assoc., 1899, 39–41.

Casein Emulsion of Cod Liver Oil—Preparation.—E. Leger employs moist casein as the emulsifying agent in the preparation of emulsion of cod liver oil. The moist casein is prepared as follows: Milk is warmed to 40°–45° C., and for each liter taken, 30 Gm. of solution of ammonia are added. The mixture is placed in a separating funnel, and set aside in a cool place for 24 hours. The lower layer of liquid is then run off, heated to 40°–45° C., and acidified with acetic acid, when the casein is precipitated. This is washed with tepid water, collected on a cloth and pressed. To prepare a liter of emulsion, the casein prepared as above, derived from a liter of milk, is taken; sodium bicarbonate, 5 Gm., are dissolved in cherry laurel water, 100, and distilled water, 50. The casein is rubbed down with the solution; at first it swells, then passes into solution, forming an opalescent liquid, which is strained into a 2-liter bottle. Cod liver oil, 500 Gm., is now gradually added to the solution, with vigorous shaking after each addition, to complete emulsification. When this is effected, simple syrup, 250 Gm., is added, and finally enough water to bring the volume up to 1 liter. The cherry laurel water is used not only as a flavoring agent, but also as a preservative.—Journ. Pharm., Aug. 12, 1899, 174; from Journ. de Pharm. [6], 9, 575.

Cod Liver Oil Balsam—Formula.—Brissemont prepares a "cod liver oil balsam," composed of: Cod liver oil, 400.0 Gm.; syrup of tolu, 200.0 Gm.; tincture of tolu, 12 drops; oil of cloves, 2 drops. This mixture is not intended to form an emulsion, but it is to be well shaken before the dose—a tablespoonful 2 to 6 times daily—is taken. It is claimed to have simply the aromatic taste of balsam of tolu.—Apoth. Ztg., Feb. 21, 1900, 126; from Bull. de Pharm. de Lyon.

Egg Emulsions—Use for Preparing Lotions.—Dr. P. G. Unna, in connection with his experiments with yolk of egg for preparing a new base for ointments (see *Unguentum Domesticum*), has experimented with the yolk as an emulsifier in place of acacia for preparing lotions, and has employed such advantageously during the period of about one year. The following general formula is given: Egg yolk, 10.0; balsam of Peru, 1.0 to 2.0; zinc oxide, 5.0 to 10.0; distilled water, enough to make 100.0. The water may be replaced by aromatic waters—peppermint, camphor or rose—by lead water, the balsam of Peru by oil of cade, birch tar, liantral,

ichthyol, or storax, while in place of zinc oxide, the same quantities of talc. magnesium carbonate, sulphur, or 1 to 2 per cent. of bismuth oxychloride may be used. Apoth. Ztg., Nov. 18, 1899, 694; from Monatsh. f. pr. Dermat., 1899, 412.

Emulsions—Formulas of the Philadelphia Hospital.—The following formulas for emulsions have been adopted in the recently revised edition of the "Pharmacopœia of the Philadelphia Hospital:"

Emulsum Olei Gaultheriæ: Oil of wintergreen, 1 Cc.; acacia, sugar, of each, sufficient: enough to make 4 Cc. Dose, one-half to one teaspoonsful.

Emulsum Olei Morrhuæ: Cod liver oil, 8 Cc.; oil of wintergreen, oil sassafras, acacia, sugar, of each, sufficient; water, enough to make 15 Cc. Dose: a tablespoonful.

Emulsum Olei Morrhuæ cum Hypophos.: Cod liver oil, 6 Cc., oil of wintergreen, oil of sassafras, acacia, sugar, of each, sufficient; syrup of hypophos, 4 Cc.; water, enough to make 14 Cc. Dose: a tablespoonful.

Emulsum Olei Morrhuæ cum Hypophos., Creosot: Creosot, 0.12 Cc.; emulsion of cod liver oil and hypophosph., enough to make 15 Cc. Dose: A tablespoonful.

Emulsum Olei Morrhuæ cum Lactophos.: Cod liver oil, 6 Cc.; oil of wintergreen, oil of sassafras, acacia, sugar, of each, sufficient; syr. calc. lactophos., 4 Cc.; water, enough to make 15 Cc. Dose: A tablespoonful.

Emulsum Olei Terebinthinæ: Oil of turpentine, 0.3 Cc.; acacia, sugar, of each, sufficient: water, enough to make 4 Cc. Dose: One to two teaspoonfuls.

Emulsum Terebeni: Terebene, 0.18 Cc.; acacia, sugar, of each, sufficient; water, enough to make 4 Cc. Dose: One to two teaspoonfuls.—Amer. Journ. Pharm., March, 1900, 133.

Unofficial Emulsions—Formulas of the Dresden Apothecaries' Society:

Emulsio Amygdalarum.—Prepared from 1 part of sweet blanched almonds with 10 parts of water.

Emulsio Amygdalarum Dulcificata.—Prepared by adding 1 part of simple syrup to 9 parts of the preceding.

Emulsio Landerer.—Pure cinnamic acid, 5; almond oil, 5; fresh egg-yolk, 15, are emulsionized with 80 parts of physiological sodium chloride solution (which see under "Liquores"). In place of this older formula,

Solutio Landerer, made by distilling 5 parts of cinnamic acid in 95 parts of distilled water, is now frequently prescribed.—Apoth. Ztg., April 7, 1900, 233.

EXTRACTA.

Extraction of Drugs—Necessity of Care in the Selection of Menstrua and Chemical Aids.—Speaking from the standpoint of German pharmacy,

A. Schneider discusses in detail the practice that has hitherto prevailed in the selection of menstrua used in the preparation of tinctures and extracts, and points out the direction in which these may be improved. With few exceptions, the method pursued in the extraction of drugs for these purposes has been identical, the variations consisting mainly in the use of alcohol of various degrees of strength, and occasionally of ether or of ether-alcohol, while the aid of chemical solvents has been readily called into requisition. Indeed, the latter has fallen into greater disuse modernly than was formerly the case, although it does not necessarily follow that the selection of the chemical aids were always the most suitable for the purpose. The necessity of adapting the composition of the solvent to the nature of the drug to be extracted, appears to have heretofore been practically ignored in the German Pharmacopœia, while the Pharmacopœias of other countries include many preparations in which this necessity is fully recognized. The author cites numerous directions in which the use of chemically active substances may be, or has been, found advantageous: In increasing the solubility of vegetable compounds by forming easily soluble compounds with them; in splitting up sparingly soluble compounds, so as to form easily soluble ones of equal efficiency; in modifying the woody and cellular tissues so as to render their contents accessible to the solvent; or, in rendering undesirable components, which otherwise would be taken into solution, insoluble in the menstruum employed. He enters into some detail in the special uses to which chemical agents may be applied in *acids*, in the extraction of drugs containing alkaloids, such as *sulphuric acid* for the preparations of cinchona; *hydrochloric acid* for those of cinchona, conium and ergot; *acetic acid* for colchicum; digitalis, ipecacuanha, opium, nux vomica, sanguinaria, etc.: *tartaric acid* for aconite, stramonium: *lactic acid* for ergot. The advantageous use of *bases* is also manifold; *Ammonia* for the extraction and fixation of acid principles, as exemplified in ammoniated tincture of valerian, in preparations of guaiac, licorice, senega, aloes, senna, rhubarb, frangula bark, or in liberating alkaloids, and rendering them soluble in the menstruum, as in oleum hyoscyami: *magnesium oxide* in frangula and cascara bark; while *calcium oxide* and the *carbonated alkalies* find similar application in various directions. Certain salts, such as *sodium chloride* and *sodium salicylate* also find useful application, the latter in particular being an excellent solvent for many resins, essential oils, glucosides and alkaloids, forming double salts with certain of the last named. The advantageous uses of *glycerin* and of *sugar* are also considered. By the judicious use of the one or the other of the chemical agents we may hope to attain the complete extraction of the desired active constituents of a drug on the one hand, and on the other the exclusion or modification of those not desirable.—Pharm. Centralh., Dec. 14 and 28, 1899, 775–778 and 807–810.

Solid Extracts—Relative Value of Ethyl and Methyl Alcohol as Men-

strua.—Discussing the uses to which methyl alcohol has been proposed for preparing various galenical preparations, such as tinctures for external use, liniments and the like, its effect upon the human system when taken into the stomach, Wilbur L. Scoville points out its possible value in replacing ethyl alcohol for preparations from which the menstruum is afterwards removed by vaporization, such as solid extracts. He records a series of experiments carried out at the Massachusetts College of Pharmacy with the view to collecting reliable data concerning the comparative value of the two menstrua for this purpose. The method followed was to make an official preparation of the drug, a tincture, extract or fluid extract, selecting that which demanded the highest percentage of alcohol, and using for one portion of drug official alcohol, and for another portion of the same drug the best commercial grade of methyl alcohol. The two preparations were made under as like conditions as possible, the two portions of drug being moistened and packed at the same time, and percolation being carried on at as near the same rate as possible and under the same conditions of temperature, and the percolates carefully watched to note any differences in color, rate of exhaustion or other characteristics which might be discernible. In all cases percolation was allowed to proceed at a rate of 10 to 20 drops per minute, and exhaustion was determined by the color and taste of the percolate, or by an absence of cloud when allowed to drop into water. The processes of the Pharmacopœia were followed in detail, except that in making extracts, the first portion of percolate was not reserved, but the entire amount was collected in one body, in order to note any physical differences and to compare the solvent powers of the two alcohols. The results are shown in the following

TABLE OF RESULTS.

	Preparation made	Amount of drug used.	Menstruum.		Total percolate obtained.		Per cent. extractive.		Active principle per cent.		Character of principle estimated.....
			Alcohol..	Water....	Ethyl	Methyl...	Ethyl....	Methyl...	Ethyl....	Methyl...	
Aconite root	Tincture ...	87.5G.	700	300	250	250	14.9	14.7			
Arnica flowers....	Tincture ...	50G.	500	500	250	250	41.3	40.0			
Arnica root.....	Tincture . .	25G.	650	350	250	250	23.2	24.1			
Belladonna leaves.	Extract	100G.	200	100	343	355	23.0	25.0	0.436	0.421	Alkaloid
Belladonna root...	Fld. ext.....	100G.	800	200	345	305	12.8	13.2	0.504	0.481	Alkaloid
Calendula.....	Tincture ...	100G.	91		500	500	18.3	17.2			
Capsicum	Tincture ...	25G	95	50	500	500	2.5	2.4			
Cannabis Indica[1]..	Extract	100G.	91		498	467	34.4	35.8			
Cannabis Indica[2]..	Extract	200	91		1272	1290	19.1	17.4			
Conium	Extract	200	500	500	1113	1110	17.0	17.2			
Ginger	Fld. ext.....	200G.	91		850	865	6.2	2.4			
Iris.....	Extract	200	91		832	856	29.9	29.9			
Nux vomica[1]	U.S.P. ext .	100G.	750	250	410	395	10.0	10.6	18.0	17.5	Alkaloid
Nux vomica[2]	U.S.P. ext..	200G.	750	250	1050	1055	13.2	12.7	20.2	19.9	Alkaloid
Podophyllum	Resin	100G.	91		168	175	12.5	11.7	5.0G.	4.5G.	Resin.
Pyrethrum	Tincture ...	40G.	91		200	200	2.1	2.2			
Rhubarb	Extract	200G.	800	200	1170	1195	53.8	53.2			
Stramonium leaves											
Stramonium seed[1].	Extract	100G.	500	500	325	320	22.7	21.3			
Stramonium seed[2].	Extract	200G.	500	500	1330	1340	20.0	19.4			
Physostigma.....	Extract	200G.	91		1209	1215	11.5	10.9			

On summarizing the results given in the table, it is shown that there are but slight differences in the action of the two alcohols upon the drugs tried. The small differences in extractive matter in the quantities of menstrua used may mostly be accounted for in difference in manipulation and errors in weight. But in no instance was there any marked difference in the appearance of the product, although slight variations were noticeable in a few instances, such as the slightly darker shade in the tinctures of aconite and arnica, and the resin of podophyllum, made with methyl alcohol, and the slightly granular appearance of extract of belladonna leaves made with this menstruum, while that made with ethyl alcohol was smooth. In the liquid preparations—tinctures and fluid extracts—the methyl alcohol could be detected by its odor, but this could not be distinguished in the solid extracts made with that menstruum. Until, however, it has been proven beyond controversy that the preparations made with methyl alcohol are free from objectionable qualities, its use for the purposes indicated in the foregoing experiments should not be countenanced.—Amer. Drugg., Sept. 11, 1899, 131–132.

Dry Extracts—Addition of Gum Arabic.—The dry extracts of several European Pharmacopœias are prepared by the addition of certain inert, or practically inert substances, either for the purpose of bringing them to a definite weight, as is the case in the Swiss Pharm., which directs them to be of one-half the weight of the drug employed, or to make the weight of the finished dry extract the same as that of the pilular extract. The Phar. Helv. directs for this purpose powdered rice, the Phar. Austr. milk sugar, and the Phar. Germ. powdered licorice root. O. Schreiber, however, finds that gum arabic is superior to the prescribed diluents for this purpose, the product remaining dry and possessing great stability.—Pharm. Centralh., March 15, 1900, 153; from Pharm. Post, 1900, 5.

Powdered Extracts—Preparation and Preservation.—Wm. E. Jenks, who has been engaged in development of a line of powdered extracts of an extensive manufacturing firm, makes some interesting observations concerning their preparation and preservation. By the use of an improved system of vacuum distillation, it is possible to concentrate the various percolates to complete dryness, protected during every stage of operation from the oxidizing influence of the air. The vacuum pan or still, which is designed for this purpose, is constructed in such a manner that a practically perfect vacuum, at a temperature not exceeding 120° F., is maintained until every trace of moisture has been eliminated and a perfectly dry, brittle mass remains. At this stage the extractive matter, as it is removed from the pan, presents a variety of interesting conditions in marked contrast to the charred masses resulting from open evaporation. The odor of the drug is strongly predominant, the fracture glistening and resinous in character, more or less transparent in thin layers, and in every case, so far as the author's observations have extended, perfectly soluble in the orig-

inal menstruum employed, indicating undoubtedly the unaltered condition of the proximate principles. After a careful determination of the actual weight of the dry extractive, sufficient diluent, in the nature of milk sugar or powdered drug, is added to bring the final product to a definite and unvarying relation to the drug, corresponding approximately to the pilular extract, and after thorough incorporation, reduced to a uniform powder. To insure an almost impalpable degree of fineness, as well as the utmost permanency for this class of preparations, it is imperative that every vestige of moisture should be dissipated, and the mass as it is discharged from the pan should be in condition to be speedily powdered. If there should remain in the charge the slightest trace of moisture, it would occasion in time a tendency to what is commercially known as "cake," a soft, pasty condition, which it assumes preparatory to reverting to the original, solid state.—Alumni Rep., Jan., 1900, 3.

Ergotins—Review of Different Products in Modern Use under this Name.—It is of interest in connection with new remedies and pharmaceutical specialties to note here the ergotins in modern demand, the following being condensed from a review of these preparations in Merck's Annual Report for 1890:

Ergotin Bonjean, well known, and representing from 5 to 6 times its weight of ergot. Dose: 0.1 to 0.3 Gm.

Ergotin Bonjean depur. pro injectione, the preceding preparation further purified, but representing only 1 part in 1.5 parts, and therefore used (hypodermically) in the correspondingly larger dose of 0.5 to 0.6 Gm.

Ergotin Bonjean sicc. cum dextrino, the same ergotin dried and mixed with an equal part of dextrin (brought to twice the original weight? Rep.), and consequently given in double the dose of ordinary ergotin Bonjean.

Ergotin Bonjean sicc. cum saccharo lactis, the same as the preceding, milk sugar being used in place of dextrin.

Ergotinum Bombelon fluidum (cornutinum ergoticum). A black-brown fluid employed both internally, in doses of 2.0 Gm., and for injections, in doses of 0.2–0.5 Gm. diluted with water to 1 Cc.

Ergotinum Bombelon spissum possesses the character of ordinary extract, and is used exclusively in form of pills (dose not given).

Ergotinum Denzel fluidum, a purified extract of ergot, which is employed in the same doses as the official (Phar. Germ.) extract.

Ergotinum Kohlmann fluidum, a black-brown fluid, soluble in water, 10 drops (1 Gm.) of which correspond to 1 Gm. of ergot. Its action is that of fresh ergot, and is given during parturition in doses of 8 to 12 drops, gradually increased to 20 to 30 drops according to circumstances.

Ergotinum purum dialysatum Wernich spissum, a dialyzed aqueous extract of ergot, which has previously been treated with ether and alcohol.

It is very readily soluble in water, and particularly adapted for subcutaneous use, being administred in relatively large doses (2 Gm. or more).

Ergotinum purum dialysatum Wernich fluidum is about one-half as strong as the preceding, and is given in correspondingly larger doses, while

Ergotinum purum dialysatum Wernich siccum is a stronger preparation, 0.7 Gm. being equal to 1.0 Gm. of the ergotinum spissum.

Ergotinum purum siccum Wiggers, a dry alcoholic extract prepared from ergot incompletely deprived of fat, and composed, according to Kobert, mainly of sphacelinic acid. It is a brown-red powder, which is soluble in alcohol, producing a solution which may be diluted with water in any proportion without producing precipitation. The dose is 0.02–0.05–0.1 Gm., the maximum daily dose being 0.5 Gm.

Ergotin Yvon, a black-brown fluid extract, containing cherry laurel water, and obtained by exhausting ergot with dilute solution of tartaric acid, 1 Gm. of powdered ergot being represented in 1 Cc. Dose: 10–20 drops; subcutaneously 1 Cc. is injected per day, and repeated every second or third day.

Meat Extract—Composition.—Reviewing the development of the meat extract industry, in a paper read before the Convention of German Naturalists and Physicians (Sept. 20, 1899), Dr. H. Bremer makes some practical observations concerning the preparation and composition, with special reference to the product from Fray Bentos. The extract is liable to separate into two layers while warm, the upper layer being spongy and composed of soluble albuminoids, while the lower is composed of extractive substances and salts. Hence the necessity of stirring the extract continuously while cooling until perfectly cold. A sample examined by the author showed strong acid reaction after purification with hot alcohol. It contained 14.86 per cent. of nitrogen, composed, as determined experimentally, partly of peptone and largely of soluble albumin. It contained 0.68 per cent. sulphur.—Apoth. Ztg., Sept. 27, 1899, 573.

Extractum Belladonnæ Viride vs. Extractum Belladonnæ Alcoholicum, B. P.—A Question for the Dispenser.—The inconvenience of two distinct preparations of the same general character and designation from the same drug is shown in the case of extractum belladonnæ viride and extractum belladonnæ alcoholicum of the B. P. Inquiries made by F. A. Upsher Smith among some of the leading pharmacists of London elicit the fact that some use the alcoholic and others the green extract when simply "extractum belladonnæ" is ordered in prescriptions; and though there is little difference which of these is used in making pills, for instance, it does make a difference in the case of suppositories, for which, in the author's opinion, as well as in the balance of evidence, the alcoholic extract is the most reliable. In support of the green extract it may be urged: 1. That

the older practitioners have it in view when writing prescriptions; 2. That in the list of alterations in the nomenclature of the preparations of the B. P., 1898, extractum belladonnæ viride is given as the new name for extractum belladonnæ. On the other hand, it may be claimed for the alcoholic extract that it is a preparation of definite strength, and, so far as suppositories are concerned, that the official suppositories of belladonna are directed to be made with the alcoholic extract. The question is evidently perplexing, and open for discussion.—Pharm. Journ., Oct. 14, 1899, 359.

Extract of Licorice—Variations in Composition.—Prof. E. Schmidt, in connection with his own results obtained in an examination of two commercial brands of licorice, tabulates the results obtained by analysts in different countries—Germany, France, Italy, Holland, Denmark, Austria, etc.—with different commercial sorts of licorice, as well as those obtained with the product of a single firm, Salvago & Co., in ten examples by as many analysts residing in different countries and localities. The essentials of the author's own results and compilation may go on record here. The two sorts examined by the author, designated respectively as "Baracco" (=I.) and "Salvago" (=II.), both being popular commercial brands, yielded the following figures:

	I.	II.
Water, at 100° C	13.100	14.520
Insoluble in water at 40°–50° C., deducting insoluble ash	22.592	13.708
Soluble in water at 40°–50° C.	60.958	66.712
Total ash	3.350	5.060

In the proposed *Pharmacopœia Germanica, Ed. IV.*, the extreme limit of water is 17 per cent., the amount remaining undissolved in water at 50° C. shall not exceed 25 per cent., and shall not reveal foreign starch under the microscope, and the percentage of ash, calculated for the air-dry extract, shall not exceed 5 to 7 per cent.

The composition of the samples examined by different analysts is shown in the two tables here following, the numbers in the first table referring to different but well-known brands, some of which appear in duplicate as indicated by the letters *a* and *b*. The second table gives the results obtained by different analysts with licorice extract of the same brand though not from identical lots.

	I *a.*	I *b.*	II *a.*	II *b.*	III.	IV *a.*	IV *b.*	V *a.*	V *b.*	VI.
Water, lost in 100° C.	14.95	12.68	10.26	10.482	13.15	15.0	11.92	12.40	10.98	11.35
Insoluble in water	27.07	17.65	26.90	28.938	27.81	29.62	27.82	32.59	31.60	26.37
Soluble in water	57.98	69.67	62.84	60.580	59.04	55.38	60.26	55.01	57.36	62.28
Ash	4.21	6.90	5.31	4.845	3.87	4.0	4.0	3.51	3.96	6.10
Glycyrrhizin	9.40	11.73	6.60	7.370	10.00	9.15	9.97	9.10	9.49	7.56

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X
Water, lost at 100° C.	14.0	12.0	13.86	11.32	15.09	14.50	13.60	13.58	12.16	15.0
Insoluble in water	19.29	16.8	16.91	17.02	17.25	18.30	19 35	20.31	17.76	12.9
Soluble in water	66.71	71.2	69.23	71.66	67.66	67.20	67.05	66.11	70.08	72.1
Ash	4.42	5.1	6.76	5 08	4.74	5.10	4.38	5 33	5.4	4.8
Glycyrrhizin	11.05	10.0	13.74	11.86	12.50	12.80	11.84	10.33	12.26	14.7

—Apoth. Ztg., March 31, 1900, 216.

Extract of Licorice—Determination of Moisture, Ash, and Water-Soluble Matter.—Edwin Dowzard finds that if complete solubility of extract of licorice in water is a criterion of purity, very few brands on the market —if any—will answer the test, as may be seen by consulting the following tables, giving the results of examination of a large number of samples of Spanish stick licorice and of "block-juice."

The estimations of the insoluble matter were made by the following method, which the author has found useful and reliable: Three Gm. of the powdered sample are dissolved in about 200 Cc. of water (at about 45° C.), the solution is allowed to settle in a tall cylinder for about six hours; the clear solution is then syphoned off, and more water added to the residue; this process is repeated until the solution has only a light yellow color. Three washings are usually required; about six drops of ammonia should be added to the last washing. The residue is transferred to a pair of counter-poised filters, dried, first at 50° C., and then at 100° C., and finally weighed.—Chem. and Drugg., Sept. 30, 1899, 562.

SPANISH JUICE (STICK).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Extractive matter	59.80	61.60	64.04	65.00	66.13	67.10	67.61	70.10	71.30	73.30	73.40	74.40	77.35	78.30	81.70	82.75
Insoluble matter	27.00	27.40	23.00	23.00	22.00	18.60	19.83	14.20	16.00	11.30	16.60	12.00	13.00	9.60	6.00	7.00
Water	13.20	11.00	12.96	12.00	11.87	14.30	12.56	15.70	12.70	15.40	10.00	13.60	9.65	12.10	12.30	10.25
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ash	4.60	4.80	6.30	6.50	7.20	9.60	7.50	7.20	3.60	7.70	8.90	7.00	3.80	6.50	8.00	8.40

BLOCK-JUICE.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.	No. 9.	No. 10.
Extractive matter	70.80	72.43	74.17	75.40	77.44	79.60	80.70	80.44	81.60	81.67
Insoluble matter	1.80	1.50	7.30	10.20	1.30	4.00	2.30	1.33	2.60	4.03
Water	27.40	26.07	18.53	14.40	21.26	16.40	17.00	18.23	15.80	14.30
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Ash	7.00	7.16	6.00	7.85	6.70	7.93	8.40	6.10	7.00	6.50

Extract of Taraxacum, U. S. P.—Deficiencies of the Official Product.—Prof. L. E. Sayre, criticising the official extract of taraxacum, remarks that a carefully made preparation of the root does certainly have aperient properties, and, doubtless, in certain hepatic troubles could be advantageously employed. The concentrated preparation, known as the extract, however, does not seem to represent the active constituents in a concentrated form. On the contrary, the author is inclined to assert that there is no other preparation in the Pharmacopœia which falls so far below what is expected of it, pharmaceutically, as this one preparation. It is supposed, of course, to represent fairly well the activity of the drug—to have its active constituents in a concentrated form; but, instead of this, we have a semi-solid mass of highly-colored glucose mixed with gelatinous (?) material. If there is any bitterness in the product, this bitterness one could easily conceive to be the result of scorching the saccharine material, as it has a caramel-like taste. If the extracts of the market fairly represent the products of the official process, the author would say that this process tends to diminish the active and increase the inert constituents. It is probable that in the reduction or concentration of the juice, even at the low temperature and diminished pressure of the vacuum pan, the acids of the juice hydrolize the glucosidal material and convert it largely, if not wholly, into glucose. These statements are confirmed by frequent assays of taraxacum of the market, one made quite recently of a representative extract bought in the open market showing the following constituents present:

	Per cent.
Moisture	23.6
Ash	5.5
Sugar	36.6

A solution of the extract after boiling with acidulated water for some time gave only a slight increase in sugar constituents (an increase of 0.6 per cent.), showing that the inulin and levulin, and possibly the taraxacin, had all been converted into sugar. Over one-half of the solid matter of the extract was composed of reducing sugars.

The author has devised a method for the assay of taraxacum root (which see under "Materia Medica") by which he has obtained results which lead him to recommend that the official extract be replaced by one in which the active constituents are presented in more concentrated form. Such a preparation would, it is true, be comparatively expensive; but unless such is adopted, it would be better to drop the extract from the Pharmacopœia.—Drugg. Circ., May 19, 90–91.

Extract of Gentian, B. P.—Elimination of Starch.—F. H. Alcock observed during the examination of some samples of extract of gentian, that one of them, when added to water (at 100° F.), gave a cloudy solution, which, on the addition of iodine to the cold liquid, gave strong indications

of the presence of starch. When the extract was examined under the microscope no granules of starch were visible. As gentian root does not contain starch under ordinary conditions, it would appear that if such be present, accidentally or otherwise, the official process for the preparation of the extract is an unfavorable one for the elimination of starch. The boiling process would be better performed (if necessary at all) after the separation of the marc than before, under which circumstances the starch would not be removed to any appreciable extent.—Pharm. Journ., Aug. 26, 1899, 206.

Extractum Caryophyllorum aquosum sfissum, a thin-fluid aqueous extract of the flower-buds of *Caryophyllus aromaticus*, introduced by Krawtschenko into ophthalmic practice, and used with success for the removal of spots on the cornea.—Pharm. Ztg., Feb. 28, 1900, 165 ; from Merck's Ann. Rep., 1899.

EXTRACTA FLUIDA.

Fluid Extracts—Profitable Preparation in Small Quantities.—E. V. Howell and C. D. Swindell record the results of preparing forty official fluid extracts in conformity with the directions of the U. S. P. in quantities of 200 Cc. It is a popular idea that these preparations cannot be successfully made by the pharmacist, and that the apparatus necessary for their preparation is expensive. To the contrary, the pharmacist can, with very little skill, make them as concentrated and as uniform in strength as the manufacturer, and the apparatus, most of which should be found in every pharmacy, is not expensive, the authors figuring up the total cost of the following requisites that may have to be added at $6.87, viz. : One condenser ; one sand bath ; one tripod ; three Erlenmeyer flasks ; one clamp ; tincture press ; specific gravity bottle and some tubing. The distilling apparatus employed by them permits of the distillation of the alcohol from the exhaust percolator of three different fluid extracts, under the arrangement shown by the accompanying cut (Fig. 53), which requires no explanation. As to the cost, when compared with the lowest cost given in the price lists, the authors show that in the case of two-thirds of the fluid extracts prepared by them the economy is on the side of the pharmacist's product, nowithstanding that the purchase price in small quantities is higher than if the ingredients are purchased in large quantities, and they think that the remaining forty-eight official fluid extracts could be prepared by the pharmacist with equally favorable results.—Bull. Pharm., Aug., 1899, 317–320.

Fluid Extract of Belladonna Root—Comparative Value of Acetic Acid and of Alcohol for the Extraction.—In a third paper, Dr. Squibb gives the details and results of further experiments undertaken to determine the relative value of acetic acid and of alcohol for the extraction of drugs, the present experiment referring to belladonna root. Operating under condi-

tions as nearly as possible identical, he found the U. S. P. menstruum (alcoholic) to give the largest yield of alkaloid in the early part of the percolate and much the smaller yield of inert and useless extractive matter, and

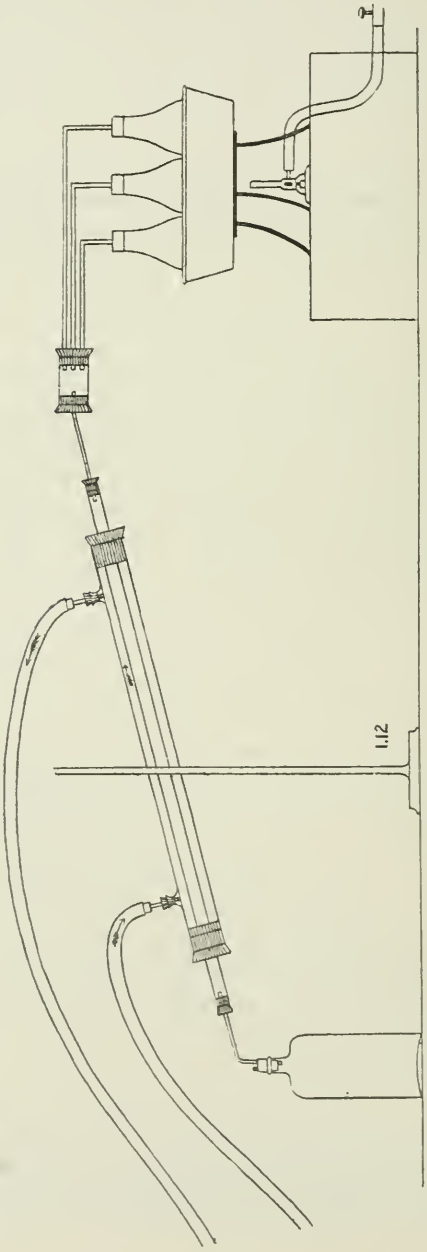


FIG. 53.

Distillation Apparatus for Fluid Extracts.

in so far the better menstruum ; but, for washing out the last portion of alkaloid, the acid menstruum (10 per cent. acetic acid) has a slight advantage, the total alkaloids, U. S. P., being 0.683, and of acid, 0.688 per cent. The management is equally easy in both, and, when both are finished to fluid extract by the U. S. P. direction, the preparations appear to be of equal value. The acid preparation is of a much lighter color, has no deposit in three months' standing, and does not precipitate on being added to water. The alcoholic preparation is of a very dark color, has a small precipitate within three months that contains traces of alkaloid, and precipitates on being added to water. The cost of the acetic acid menstruum is, of course, much less than that of the alcoholic. In connection with this investigation, the author offers a new process of assay, based on the extraction of the drug with 10 per cent. acetic acid, which see under "Belladonna Root."—Amer. Jour. Pharm., Jan., 1900, 1–9.

Liquid Extract of Cinchona, B. P.—Remarkable Discrepancy in the Results of Standardization between the Methods of the 1885 and 1898 Standards.—Edmund White calls attention to some experiments carried out in his laboratory by E. Gant, which show that, owing to the extra purification enjoined by the B. P. 1898, one may get less than half the weight of residue when carrying out the official process of standardizing liquid extract of cinchona that is obtained when the directions of the B. P. 1885 are followed. Comparing the two residues, that obtained by the latter process is dark and amorphous, while that obtained by the 1898 process is nearly colorless and distinctly crystalline. In the experiments referred to, 10 Cc. of percolate were treated with benzolated amylic alcohol and potassium hydroxide, as described in the Pharmacopœia. The washed alcoholic layers were united and divided into two equal parts. One part was evaporated to dryness on a water-bath as required by the 1885 B. P. assay process. The other part was subjected to the further purification required by the 1898 B. P., viz.: (1) Removal of the alkaloids as hydrochlorides from the benzolated amylic alcohol by agitation with dilute hydrochloric acid ; (2) transference of the alkaloids, liberated by the addition of ammonia, to chloroform ; (3) evaporation of the chloroformic solution, and drying the residue at 110° C. The benzolated amylic alcohol after agitation with dilute hydrochoric acid was also evaporated, dried and weighed. In three experiments recorded the yield of residue by the assay process of 1898 was less than one-half that obtained by the assay process of 1885, while the determination of residue of evaporation in the benzolated amylic alcohol after extraction with dilute hydrochloric acid, in two of the experiments, yielded figures which, as might be expected, represented the difference in weight between the residue obtained by the different assay processes. Experiments also seem to indicate that this last benzolated amylic alcohol residue is practically free from alkaloid, and that therefore the extract standardized according to the 1885 B. P. would contain less than 2½

per cent. of pure alkaloid. The assay process now employed is undoubtedly a great advance upon its predecessor; at the same time, the author maintains, there is no doubt that for thirteen years an extract has been supplied officially, which was credited with a potency which it can not have possessed.—Pharm. Journ., Sept. 30, 1899, 316.

Fluid Extract of Cinchona, Pharm. Helv. III.—Improvement of Solvent.—While the Swiss Pharmacopœia requires the official cinchona barks to contain at least 5 per cent. of alkaloids, it requires that the fluid extracts made from them shall contain 3.64 per cent. Willy Wobbe, experimenting in order to find an explanation for these contradictory requirements, finds that the lower figure for fluid extracts is evidently based on practical results obtained by following the official process; in other words, that the official process, which is based on the method of De Vrij, does not extract or hold in solution all the alkaloid contained in the bark. By this process, the bark is preliminarily macerated with a mixture of water, glycerin and hydrochloric acid, then percolated to exhaustion, a portion of the percolate being reserved and the remainder concentrated and added to the reserved portion together with about 10 per cent. of alcohol. Operating in this way upon a bark known to contain 6.5 per cent. of alkaloid, Mr. Wobbe obtained a product containing only 4.5 per cent. of alkaloid; but if, instead of water, alcohol in certain proportion was used, a product was obtained which contained the alkaloid in practically the same proportion as in the original bark. He employs the cinchona in moderately fine powder, moistens this with 50 per cent. of its weight of a mixture of 100 parts of glycerin, 100 parts of alcohol, 30 parts of 25 per cent. hydrochloric acid, and 70 parts of water, macerates for 24 hours, and then percolates with alcohol of 69 to 70 volume per cent. to complete exhaustion. The first 70 parts from 100 parts of bark are set aside, the remainder of the percolate, amounting to nearly 12 times the weight of the bark, is concentrated to 30 parts and added to the reserve portion to complete the fluid extract. The author has also found the official process for the

Assay of Fluid Extract of Cinchona to yield unsatisfactory results, and suggests the following modification: Shake a mixture of 6 Gm. of the fluid extract, 20 Gm. of water, 120 Gm. of ether, and 10 Gm. of 10 per cent. soda solution, vigorously for five minutes and then allow to stand for one hour. Then decant two separate portions of 50 Gm. of the ether solution, each representing 2.5 Gm. of the fluid extract, distill off the ether, dissolve the residue in 20 Cc. of $\frac{N}{10}$ hydrochloric acid and 20 Cc. of alcohol, filter, if necessary, wash the filter with a little alcohol, and titrate the excess of hydrochloric acid with $\frac{N}{10}$ soda solution, using cochineal, hæmatoxylin or rosolic acid as indicator, and alternating with the one or the other of these with the second portion of ether solution for the purposes of control. The author accepts as factor for succirubra-bases the figures 304; hence, 1 Cc. of $\frac{N}{10}$ hydrochloric acid consumed is equivalent to

0.0304 Gm. alkaloid. Similarly the author has modified the official method for the

Assay of Cinchona Bark.—He substitutes a 10 per cent. solution of soda for the ammonia employed officially along with ether to extract the alkaloids from powdered bark, shakes out the ethereal solution of the alkaloids with $\frac{N}{10}$ hydrochloric acid, and titrates the excess with $\frac{N}{10}$ soda solution, using the same indicators and factor as in the case of fluid extracts.—Apoth. Ztg., Sept. 16, 1899, 550–551.

Acetic Fluid Extract of Cinchona—Comparison with and Advantages over the Official Fluid Extract.—In continuation of his investigations concerning the value of acetic acid as a substitute for ethyl alcohol in extracting the active principle of some official drugs, Dr. Edward R. Squibb selected cinchona for his experiment, both on account of its importance and on account of the well-known difficulty of exhausting this drug by any menstruum hitherto known. The experiments are described in detail, and the results, shown in the form of tables, are summarized by the author as follows: 1. That 10 per cent. acetic acid is a good menstruum for the exhaustion of cinchona. 2. That the U. S. P. menstruum is a better one for rapid exhaustion, but the percolates are so loaded with useless and objectionable organic matter, from which the acetic acid percolates are comparatively free, that this difference in the character of the results transfers the advantages to the acetic acid side. The stronger percolates from the alcohol and glycerin menstruum are almost syrupy in consistence, are so black as to be almost intransparent, are very astringent, and throw down an unmanageable precipitate of nearly insoluble cincho-tannates on dilution or admixture with other preparations or any ordinary diluents. These disadvantages are of so serious a character as to have always obstructed the use of the official fluid extract and extract.

The acetic acid stronger percolates are nearly free from these disadvantages, and are far more manageable pharmaceutically as well as therapeutically. It is hardly within the range of possibility that a fluid extract or extract which on dilution splits into insoluble or difficultly soluble cincho-tannates can be a good therapeutic agent, or that a preparation of the same alkaloidal strength that does not so split on dilution is not better. The acetic acid menstruum is not only very much cheaper, but it is also much easier to manage in the percolation and in the standardizing process, since evaporation does not injure the percolate nor materially increase the cost by the loss. On these lines the author suggests a process for the assay of "*cinchona*," which see under "Materia Medica." Fluid extract of cinchona prepared with 10 per cent. acetic acid was proved to contain, when finished with evaporation of a portion of the percolate, 10, 10.2, and 11 per cent. of free acetic acid in three examples, the smaller percentage being present where there had been most evaporation. The lowest of these proportions is quite sufficient to secure the stability and

permanence of the preparations under all ordinary conditions. When the fluid extract is mixed with three or more times its volume of water, the mixture has the appearance of coffee with milk, and in this condition the taste of free acid is very slight and not disagreeable. The author reaches the conclusion that in all discovered ways the fluid extract prepared as outlined with acetic acid is a better therapeutic agent and a more eligible preparation than the official fluid extract, and at a far less cost.—Amer. Journ. Pharm., July, 1899, 305–312.

Acetic Fluid Extracts—Protest Against their Introduction into the U. S. P.—Samuel Case, referring to Dr. Squibb's paper on acetic acid as a substitute for ethyl alcohol in extracting the active principles of plants, enters a protest against the use of acetic acid for the purpose of making fluid extracts. He fails, however, to present any valid reason why such should not be made if it should be proved, as Dr. Squibb claims, that the preparations when made with acetic acid represent the full activity of the drug at less cost than when alcohol is used, and if there be no objection, therapeutically, to the presence of acetic acid in such.—Merck's Rep., Nov. 1899, 506.

Liquid Extract of Ipecacuanha, B. P.—Modification to Secure Permanent Clearness.—While satisfactory in respect to keeping properties, aroma and composition, the official B. P. liquid extract of ipecacuanha lacks, according to F. C. J. Bird, the property of keeping bright and forming a bright mixture with detannated wine. He therefore suggests that the liquid extract be submitted to the following treatment: Mix 1000 Cc. of the liquid extract with 1000 Cc. of distilled water, allow the mixture to stand in a cool place for twenty-four hours and filter, washing the filter with a little water until it passes colorless. Acidify the clear filtrate and washings with acetic acid until faintly acid, distill until the distillate contains 400 Cc. of absolute alcohol this will generally measure about 520 Cc.), and reserve this portion of the distillate. Recover the alcohol from the remainder of the liquid extract and evaporate the residue to about 420 Cc.; allow to cool, pour off the bright liquid from the slight oily or resinous deposit that forms, and add to the reserved alcoholic distillate. Finally, make the total volume to 1000 Cc. with the aqueous washings obtained from the resinous matter adhering to the dish. These washings should, if necessary, be filtered clear before adding them to make up the required measure. In a similar way a

Glycerole of Ipecacuanha may be obtained. Following the same process, the alcoholic distillate is rejected for the final preparation. The aqueous solution finally remaining is concentrated to 500 Cc., and, observing the precaution to secure this quantity perfectly clear, it is mixed with 500 Cc. of glycerin.—Trans. Brit. Phar. Conf., 1899, 357–361.

Liquid Extract of Ipecacuanha, B. P.—Criticism of the Official Assay

Process.—E. H. Farr and R. Wright, criticising the B. P. process for the determination of the alkaloids in liquid extract of ipecacuanha (and incidentally of the wine and vinegar), observe that the process possesses every possible fault, without a single compensating advantage. It would be impossible to imagine a method of assay more complicated, more wasteful of material or more tedious in operation. As already pointed out in the recent well-merited criticism and unqualified condemnation by Wilson (see Proceedings, 1899, 431), a considerable amount of alkaloid is lost in the lead precipitate; but this is not all, since the authors now find that the residue finally weighed and reckoned as "total alkaloids" contains from 12 to 20 per cent. of foreign matter. While the authors concede the process recommended by Wilson to be much more satisfactory than the official one, they have experimented with the view to devising a process which shall combine economy, simplicity and accuracy with rapidity of working, and as a result recommend the following as fulfilling these conditions, but here given in brief outline: Acidulation of 5 Cc. of the liquid extract with 10 drops of diluted sulphuric acid in 5 Cc. of water; evaporation to 3 Cc: transference to a separator, in which it is shaken with 15, 5 and 5 Cc. of chloroform after having rendered the liquid alkaline with ammonia in excess; shaking out the united chloroformic solutions with three successive quantities of 10 Cc. of 1 per cent. sulphuric acid; shaking out of the united acid solution so obtained with ammonia and chloroform; evaporation of the alkaloidal-chloroform solution to constant weight; and, finally, titration of the residual alkaloid with $\frac{N}{10}$ hydrochloric acid and $\frac{N}{20}$ soda solution. For rapid work in laboratories the process may be shortened by directly evaporating the chloroformic solution of alkaloid initially obtained and titrating the residual alkaloid. The results in practised hands, presents no difficulties.

A second paper on the same subject is one presented by W. A. H. Naylor and John J. Bryant. The authors make practically the same criticisms as those made by Messrs. Farr and Wright, and describe several processes tried by them, among them one which is essentially that of the latter experimenters. This, though yielding good results, is tedious consequent on the difficulty with which separation is effected, and they therefore prefer one which may be briefly outlined as follows: The alcohol is evaporated from 10 Cc. of the liquid extract; it is transferred to a flask with a mixture of 2 Cc. of diluted sulphuric acid and 30 Cc. of water, filtered and brought to 50 Cc. Of this filtrate, 25 Cc. are shaken out with two portions of 10 Cc. of chloroform; the filtrate is then rendered alkaline with ammonia and shaken out thrice with 10 Cc. of chloroform; the united chloroformic solutions of the alkaloids are evaporated, weighed and finally titrated with $\frac{N}{10}$ hydrochloric acid.

The authors of both of the papers quoted in the foregoing give tables exemplifying the accuracy of the processes advocated by them. They

also give processes modified to suit the assay of the official (B. P.) wine, and vinegar of ipecacuanha.—Trans. Brit. Pharm. Conf., 1899, 337–348.

Extractum Ipecacuanhæ Liquidum—Modification of B. P. Assay Process.—Based upon certain experiments which are briefly recorded, F. H. Alcock proposes the following modification of the B. P. process for assaying liquid extract of ipecacuanha as possessing the advantages of celerity and accuracy, and being less "messy." Five Cc. of the liquid extract are mixed with 5 Cc. of B. P. dilute sulphuric acid, and well shaken with 10 Cc. of ether. The ethereal layer is decanted after complete separation by standing, the residual heavy layer treated in the same way with 5 Cc. of ether, and the mixed ether solutions are then washed twice with small quantities of water, these washings being added to the heavy alkaloidal solution. The latter is transferred to a separator, 7.5 Cc. of ether-chloroform (1 vol. ether to 2 vol. chloroform) are added, ammonium hydroxide is added to alkalinity, the mixture well shaken, then warmed to 120° F., and the lower layer separated and treated once or twice more in the same way with suitable quantities of ether-chloroform. The united ether-chloroform solutions are then evaporated and the residue is dried to constant weight in the usual manner.—Pharm. Journ., Nov. 25, 1899, 494.

After reviewing some of the difficulties encountered in the official process (B. P.) for assaying liquid extract of ipecacuanha, and the various modifications proposed—by Wright and Farr, Naylor and Bryant, Wilson, and others, H. J. Henderson also calls attention to the foregoing modification proposed by F. H. Alcock, which he characterizes as being a very neat and rapid process. It emulsifies but little, and if the chloroformic solution of the alkaloids be washed with a little ammoniated water, the resulting solution compares favorably with the corresponding B. P. solution as does also the yield of alkaloid.—Ibid., Dec. 13, 1899, 602.

Liquid Extract of Ipecacuanha, B. P.—Stability.—J. W. Thomson expresses astonishment as to the statements made regarding the stability, or rather instability, of liquid extract of ipecacuanha. Having worked up large quantities of the root, principally into liquid extract, he claims that his experience points out the great stability of this preparation. A lot of 12 gallons after six months showed the same alkaloidal value, viz., 2.1 per cent., that it had originally, and several more recent lots bear out the same stability. Some liquor made seven months ago, containing 1.4 per cent. total alkaloid, using a 25 per cent. alcoholic menstruum, remains unimpaired in strength; it still contains 1.4 per cent., and proves great stability, although made with a weaker menstruum than that of the B. P.—Pharm. Journ., Jan. 20, 1900, 54.

Liquid Extract and Wine of Ipecacuanha, B. P.—Reduction in Strength on Keeping.—R. Glode Guyer, having reassayed after two months' keep-

ing some liquid extract of ipecacuanha and found its strength reduced from 2.08 per cent. to 1.528 per cent. of alkaloids, extended his investigation to other samples of liquid extract, as well as to wine of ipecacuanha, which is officially made from it. A sample of liquid extract made from Carthagena ipecacuanha, which originally assayed 2.1 per cent., assayed only 1.525. Wine of ipecacuanha made from the first mentioned extract, assayed only 0.025 per cent. instead of 0.10, as it should officially. Samples of wine purchased from London retail pharmacists of known exactitude and competence, assay 0.0788, 0.0384 and 0.0348 per cent.; samples from leading manufacturers, 0.0882, 0.1022 and 0.077 per cent. A sample of liquid extract from a provincial house came up to the B. P. requirements. It assayed 2.018. The wines from the retail pharmacists and those from stock were uniformly bright and clear; those from the manufacturing houses were opaque and dull, being possibly made by simple admixture without filtration, and apparently of recent date.—Pharm. Journ., Dec. 30, 1899, 622.

Liquid Extract and Tincture of Jaborandi—Unsatisfactory Quality as found in British Pharmacies.—See *Jaborandi*, under "Materia Medica."

Aromatic Fluid Extract of Cascara—Preparation without Alcohol.—Prof. Wilbur L. Scoville calls attention to the following formula, supplied by Prof. La Pierre, for a bitterless aromatic fluid extract of cascara, which has been thoroughly tested, both pharmaceutically and therapeutically, and found satisfactory, as well as commercial and simple: Shake about 2 ozs. of quicklime, add a pint of water, stir in 1 pound of ground cascara bark, and add sufficient water to make a soft mush. Heat on a water-bath for six hours, or until the bitter taste has become faint, keeping up the volume of water. Transfer the magma into a percolator, allow it to drain, and percolate with lime water until the drug is exhausted. Evaporate the percolate to 12 fluid ounces, filter if necessary, and dissolve 6 ounces of sugar in the filtrate. Finally add 6 minims of oil of coriander and 5 minims of oil of anise, and shake well. The product keeps well, is effective and pleasant. —Proc. Mass. State Pharm. Assoc., 1899, 54.

Extractum Quebracho Fluidum—Formula of the Dresden Apothecaries' Society.—100 parts of powdered quebracho wood are macerated for 3 days with 400 parts of distilled water, then boiled together one hour, and allowed to cool; 100 parts of alcohol are now added, the mixture is set aside for 2 days, expressed and filtered. The filtrate is evaporated to 90 parts, 10 parts of alcohol are added, and, after subsidence, the product is filtered.

Extractum Valerianæ Fluidum is prepared from coarsely-powdered valerian root with diluted alcohol in conformity with the general directions of the Germ. Pharm. for fluid extracts.—Apoth. Ztg., April 7, 1900, 233.

Fluid Extract of Muira-puama.—Preparation—Cæsar and Loretz give

the following formula for preparing a fluid extract from the drug imported from Brazil under the name of "Lignum Muira-puama," and valued there as an aphrodisiac and mild tonic: 100 p. lign. muira-puama, in coarse powder, 20 p. alcohol (90 per cent.), and 10 p. glycerin are mixed together, allowed to stand two hours, packed in a percolator, and percolated with diluted alcohol, the product being finished according to the general directions of the Germ. Pharm. for fluid extracts, and requiring from 400 to 500 p. of the diluted alcohol of that Pharmacopœia. The dose is 2 to 3 Gm., twice or thrice daily.—Pharm. Ztg., Oct. 25, 1899, 762.

Distilled Extract of Witchhazel — Desirability of a Method of Testing.—Prof. L. E. Sayre calls attention to the variability of the distilled extracts of witchhazel of the market, and considers it desirable that a method of testing this product be established. One of his students, Mr. R. E. Marsh, and his associate, Mr. L. V. Havenhill, have made some experiments in this direction. Mr. Marsh conceived the idea of noting the relative degree of the reducing power of witchhazel extracts on $\frac{N}{10}$ potassic permanganate V. S., and to ascertain the alcoholic strength. Operating under these provisions, Mr. Havenhill examined two different samples. 100 Cc. of the one reduced 2 Cc. of the $\frac{N}{10}$ V. S. of permanganate in the cold, while the distillate from it was without action, and the residue reduced about the same amount. It contained 9 per cent. of alcohol. The second, in the same quantity, reduced 2.8 Cc. of $\frac{N}{10}$ U. S. of permanganate, the distillate did not *readily* reduce permanganate, and the residue reduced the same quantity as the original extract. This extract contained 10 per cent. of alcohol. The first 50 per cent. of distillate from both contained all the fragrant principles in both cases. It is evident, therefore, that the volatile constituent of the extracts of witchhazel examined is not the reducing substance, and that further experiments are required to establish a method for testing them satisfactorily.—Merck's Rep., Dec. 1899, 549.

GLYCERITA.

Glycerite of Licorice—A Good Substitute for all Other Licorice Preparations.—A. E. Hiss recommends a glycerite of licorice as a substitute for the fluid extract, the purified extract of the N. F., or any other extract of licorice, and prefers it. To make it, 13 ozs. av. of the commercial extract, stick or mass, is placed in about 3 pints of water, the solution being hastened by stirring and by setting the vessel in a warm place. Solution should be completed in 24 to 48 hours; if it takes longer a small amount of alcoholic solution of salicylic acid is added (? Rep.) for preservation. Then filter, evaporate the filtrate to 12 fluid ounces, add 4 fluid ounces of glycerin, and mix well.

Glycerinum Iodatum—Formula of the Dresden Apothecaries' Society.—Dissolve 1 part each of iodine and potassium iodide in 98 parts of glycerin. —Apoth. Ztg., April 7, 1900, 234.

Glycerite of Codeine—Development of Unpleasant Odor in Presence of Hydrochloric Acid.—Archibald Currie, having occasion to make a glycerite of codeine, 2 grains in each ounce, at first employed alcohol for effecting the solution of the codeine; but finding that an excessive amount of alcohol (℥ij.) was necessary to prevent crystallization of the codeine from solution, he conceived the idea of using hydrochloric acid and hastening solution by heating—the modified solution being as follows: Codeine, gr. ii.; dilute hydrochloric acid, ♏ ii.; water, ♏ xx.; glycerin, ad ℥j. To his surprise this mixture developed a yellowish color and most disgusting odor, which subsequently was proven to be due to some unexplained reaction between the hydrochloric acid and glycerin—even Price's glycerin producing this reaction, though in a less degree. When dilute sulphuric or phosphoric acid solution was used, the solution remained clear (colorless, ? Rep.) and odorless.—Pharm. Journ., April 21, 1900, 418.

INFUSA ET DECOCTA.

Infusions and Decoctions—Preparation by Percolation.—At the meeting of Swiss Naturalists in Berne, 1898, A. Conrady called attention to the advantages of preparing infusions and decoctions by percolating the drug in a finely divided condition in a specially constructed apparatus with hot or boiling water. He has since had opportunity to employ the method for the preparation of the various decoctions and infusions prescribed—Infus. arnicæ, Infus. digitalis, Infus. senegæ, Infus. secal. cornut., Infus. rad. rhei, Decoc. condurago, Decoc. cortic. chinæ, etc.—and finds in each case that the products are superior to those made by the customary method of simply infusing or boiling the coarsely cut or comminuted drug. The author, who appears to have received enconiums from physicians and pharmacists of reputation, has patented the special apparatus required; one looks in vain, however, for a nearer description of it in either of the two papers which have come under the notice of this reporter.—Apoth. Ztg., July 12, 1899, 414.

Infusion of Digitalis—Preparation by Hot Percolation.—In connection with his studies concerning the comparative quality of *Digitalis* leaves grown in different localities (which see under "Materia Medica"), Hans Benyscheck gives the result of a series of experiments undertaken to determine the best method of preparing the infusion. He finds this to be the method of hot percolation, which consists in percolating with hot water in a percolator with double walls through the intermediate space of which steam is caused to circulate continuously during the percolation. The leaves are thus exhausted more completely with one half the solvent necessary when the ordinary methods, digestion or simple percolation, are followed, while the loss of crude digitoxin is reduced to a minimum.—Pharm. Post, 1899, 451.

LINIMENTA.

Official Liniments—Objections to Cotton-Seed Oil.—P. E. Hommell points out that white cotton-seed oil was used as a basis for making three official liniments of the U. S. P. 1880—the ammonia, lime and subacetate of lead liniments—it was discarded from the lime liniment on account of its unsatisfactory saponification at the revision in 1890, though still retained for making the ammonia liniment, the lead liniment having been dropped At present it is used also as the basis for camphor liniment, for which olive oil was formerly used. As was the case with the lime liniment, the difficulty to saponify cotton-seed oil makes it objectionable as the base for ammonia liniment, and it should be therefore replaced, preferably by lard oil. But objections are also found to its use as the base for camphor liniment. It produces a liniment deficient in color, odor, body and medicinal action. When applied by friction it is not as smooth as when prepared with olive oil, is not absorbed by the dermal surface as it should be, is sticky, and lacks the emollient, penetrative and anodyne action which the average physician desires when he prescribes this application. The author therefore advises a return to olive oil as a basis for camphor liniment, and that cotton-seed oil be dismissed from the Pharmacopœia.—Drugg. Circ., March 1900, 48.

Liniment—Formulas of the Philadelphia Hospital.—The following formulas for liniments have been adopted in the recently revised edition of the "Pharmacopœia of the Philadelphia Hospital:"

Linimentum Chloroformi Compositum—Tr. aconite, 15 Cc.; tr. arnica, 30 Cc.; water of ammonia (17.5 per cent.), 30 Cc.: lin. chloroform, enough to make 180 Cc.

Linimentum Gaultheriæ Compositum.—Oil of gaultheria, 13 Cc.; alcohol, 60 Cc.; tr. capsicum, 15 Cc.; soap liniment, enough to make 180 Cc.

Linimentum Terebinthinæ Compositum. — Oil of turpentine, water of ammonia, of each, 30 Cc.; soap liniment, enough to make 180 Cc. — Amer. Jour. Pharm., April, 1900, 182.

Linimentum Ammoniæ, B. P.—Improved Formula.—J. Clowes remarks that the ammonia liniment of the B. P., 1885, was a very troublesome preparation, frequently requiring thinning with very dilute ammonia before it could be poured from the bottle. The product of the B. P., 1898, also gives similar trouble after it has been made a week or two, but this can be overcome by adding 1 oz. of water to about 16 ozs. of the liniment, thus: Take of almond oil, 4 ozs.; olive oil, 8 ozs.; solution of ammonia, 4 ozs.; distilled water, 1 oz. This becomes whiter on keeping, without becoming thick. It would be an improvement also to direct this liniment to be made by weight, as might also

Linimentum Camphoræ, B. P., the formula for which might con-

veniently read: Camphor, 1¼ lb.; olive oil, 4½ lbs. — Pharm. Journ., June 30, 1900, 689.

Camphor Liniment—Polarimetric Method of Determining Camphor Content.—Recent prosecutions (in England) for deficiency of camphor in camphorated oil make it necessary to determine the percentage of camphor before placing the preparation in stock. Edwin Dowzard observes that the gravimetric method, which depends on driving off the camphor by heat, weighing before and after, is tedious, requiring several hours, and gives high results, owing to the loss in weight of the olive oil. He therefore suggests the polarimetric method which, he finds, gives fairly accurate results. It is true, that the optical solution of camphor is sure to vary, but so far as the author's experience goes, the variation does not seriously affect the result. Using an instrument of the Laurent half-shadow type, the optical solution of the sample is taken at 15° C. in a 100 Mm. tube. The result is then multiplied by the factor 1.962, which gives the percentage of camphor by weight. This multipher was arrived at by dividing the percentage of camphor in a sample by the rotation, and taking the mean of all the results obtained. The percentage of camphor, taking the specific gravity of the olive oil used as 0.916, is 21.44 per cent. In a sample the gravimetric method indicated 21.45 per cent.; the optical rotation was + 11.00°, which, multiplied by 1.962, gives 21.58 per cent.—Chem. & Drugg., Feb. 24, 1900, 338.

Linimentum Capsici Compositum—Approved Formula.—C. Fassati recommends the following formula for a compound capsicum liniment: 500 parts of capsicum fruits in a coarse powder are percolated with a mixture of 125 parts each of ether and alcohol, followed by alcohol until 1250 parts of percolate are obtained. In this dissolve 500 parts of camphor, and add 625 parts of ammonia water of sp. gr. .910 and 10 parts each of oil of thyme and oil of lavender. The capsicum fruits should not be dried too strongly, otherwise much of the capsicin is lost.—Pharm. Post., July 23, 1899, 407; from Farmac. Revue.

Linimentum Capsici Compositum—Formula of the Dresden Apothecaries' Society.—Tincture of capsicum (prepared in the proportion of 1 part of capsicum to 3 parts of alcohol), 525; soap, 3; camphor, 30; oil of rosemary, oil of lavender, oil of thyme, oil of cloves, of each 10; oil of cinnamon, 2; ammonia water, 100 parts.—Apoth. Ztg., April 7, 1900, 234.

Veterinary Liniments—Useful Formulas.—W. A. Dawson calls attention to the following formulas for liniments which are in constant use in one of the eastern hunting clubs for hunters and polo ponies:

Rubbing Liniment, "Sherwood's:" Camphor, 3 ozs.; tincture of cantharides, 3 ozs.; tincture of capsicum, 3 ozs.; alcohol, 1 pint; tincture of arnica, 1½ pint.

Gasolene Liniment: Alcohol, gasolene, tincture of arnica, of each ½ pint; tincture of iodine, 4 ozs.

Leg Lotion: Corrosive sublimate, 1 oz.; muriate of ammonia, 2 ozs.; acetate of lead, 3 ozs.; sulphate of copper, 2 ozs.; ether, 3 ozs.; alcohol, ½ pint; water, 1½ gal.

The first two are stimulating embrocations for lameness and soreness, the second being the stronger. The third is an astringent, antiseptic wash, applied to hunters, polo ponies and race horses after a hard run or race.—Amer. Drugg., Nov. 10, 1899, 259.

LIQUORES.

Percentage Solutions of the B. P.—Criticism and Definition.—F. A. Upsher Smith reviews the various interpretations that are or may be put on the term "percentage solutions," noting the inconsistencies in the percentage solutions of the B. P., and summarizes his views concerning them as follows; 1. True percentage solutions, containing *x* parts by weight in 100 parts by weight, are not desirable so long as liquids are measured. 2. Solutions containing *x* grains in 110 minims are unnecessary and clumsy, because they serve no useful purpose, and do not admit of consistent and simple dosage of potent drugs. 3. Solutions containing *x* grains in 100 minims, or the official dose of the liquid, are the simplest, most convenient and consistent with the dose of crude drugs.—Pharm. Journ., Sept. 30, 1899, 317.

Liquores and Solutions.—Formulas of the Dresden Apothecaries' Society—

Liquor Ammonii Benzoici: White, sublimed benzoic acid, 17.5 parts, are suspended in distilled water, 50 parts, and ammonia water, 24 parts, gradually added while stirring. The liquid is then exactly neutralized with ammonia water, brought to a total weight of 200 parts with distilled water, and filtered. The product should be colorless or faintly yellowish, clear, perfectly volatile, neutral or barely acid in reaction, and contains 10 per cent. of ammonium benzoate.

Liquor Chlorali Bromatus.—To be prepared from: Chloral hydrate, 8.0 Gm.; potassium bromide, 6.0 Gm.; extract of hyoscyamus, 0.3 Gm.; extract of Indian hemp, 0.05 Gm.; peppermint water, 4.0 Gm.; orange flower water, 30.0 Gm.; chloroform, 6 drops; tincture of ginger, 3.0 Gm.; syrup of licorice, 45.0 Gm.; water, 32.0 Gm.

Liquor Colchici Compositus.—Colchicine, 0.1 Gm.; extract of colocynth, 0.05 Gm.; dissolve in sherry wine, 100 Gm.

Liquor Lithantracis Acetonatus.—10 parts of coal tar are dissolved in 20 parts of benzol and 73 parts of acetone. The solution is allowed to stand several days, and then filtered.

Liquor Lithantracis Compositus.—5 parts of potassium sulphide are triturated with 4 parts of sodium hydroxide solution, and heated in a close vessel at a temperature of 40° C. for one hour with 20 parts of alcohol. On

cooling, the mixture is filtered and the filtrate brought to the weight of 29 parts by the addition of alcohol. To this 50 parts of "Liquor Lithantracis Simplex" (prepared as directed in the formula next following) are added, and finally, a solution of 10 parts of resorcin, 2 parts of salicylic acid and 0.5 part of castor oil, in 20 parts of alcohol.

Liquor Lithantracis Simplex is prepared by dissolving 10 parts of coal tar in 20 parts of benzol, adding 20 parts of alcohol, allowing the mixture to stand several hours at 35° C. with occasional shaking, and decanting from the undissolved sediment. To the clear decantate a mixture of 5 parts of alcohol, 4 parts of solution of sodium hydroxide, and 1 part of castor oil is then added.

Solutio Acidi Picronitrici "Esbach"—Esbach's Reagent.—Picric acid, 1 ; citric acid, 3 ; water, 96 parts.

Solutio Bismuti Alkalina—Nylander's Reagent: Bismuth subnitrate, 2 ; potassium and sodium tartrate, 4 ; solution of sodium hydroxide, 50 ; water, 44 parts.

Solutio Boro-Salicylatus: Boric acid, 6 ; salicylic acid, 1 ; water, 293 parts.

Solutio Natri Chlorati Physiologica—Physiological Sodium Chloride Solution: To be prepared by dissolving 6 parts of sodium chloride in 994 parts of water, filtering the solution and sterilizing.—Apoth. Ztg., April 7 and 21, 1900, 234 and 270.

Liquores—Formulas of the Philadelphia Hospital.—The following formulas for liquores have been adopted in the recently revised edition of the "Pharmacopœia of the Philadelphia Hospital."

Liquor Acidi Borici: Boric acid, 1 Gm. ; distilled water, 30 Cc.

Liquor Acidi Carbolici: 1 : 40 and 1 : 20.

Liquor Antisepticus Alkalinus: Sodium borate, 4 Gm. ; sodium bicarbonate, 4 Gm. ; sodium salicylate, 0.25 Gm. ; menthol, 0.065 Gm. ; thymol, 0.065 Gm. ; glycerin, 23 Cc. ; boiling water, enough to make 120 Cc.—One teaspoonful (= 4 Cc.) to be added to two tablespoonfuls or more of water, to be used as a wash.

Liquor Antisepticus: An antiseptic solution containing : Menthol, thymol, sodium benzo-borate, and the essential principles of gaultheria and eucalyptus, in aqueous solution, with 25 per cent. by volume of alcohol.*

Liquor Hydrargyri Chloridi Corrosivi: 1 : 2000 ; 1 : 1500 ; 1 : 1000.

Liquor Hydrargyri Chloridi Corrosivi Fortior (1 : 8) ; Corrosive mercuric chloride, 24 Gm. ; ammon. chloride, 16 Gm. ; distilled water, enough to make 180 Cc. One teaspoonful (= 4 Cc.) added to one pint of water yields a 1 : 1000 solution of corrosive mercuric chloride.

* It is not clear why the proportions are not given in this formula.—Rep.

Liquor Lithii Bromidi: Lithium bromide, 0.5 Gm.; solution of potass. citrate, 2 Cc.; peppermint water, enough to make 4 Cc. Dose: One to four teaspoonfuls.

Liquor Potassii Permanganatis: Potassium permanganate, 12 Gm.; distilled water, enough to measure 180 Cc. One teaspoonful (= 4 Cc.) added to one pint of water, yields a 1 : 2000 solution of potassium permanganate.

Liquor Sodii Phosphatis: Each teaspoonful represents about 60 grains (4 Gm.) of crystallized sodium phosphate and 15 grains (1 Gm.) of 50 per cent. phosphoric acid in water. Dose: One or two teaspoonfuls in a wineglassful or more of water, preferably hot, three times a day, one hour before meals.

Liquor Strontii Bromidi: Strontium bromide, 0.5 Gm.; chloroform water. 1.8 Cc.; bitter almond water, enough to make 4 Cc. Dose: One to four teaspoonfuls.—Amer. Jour. Pharm., April and May, 1800, 182 and 232.

Strong Solution of Ammonia, B. P.—Discrepancy between Required Specific Gravity and Strength.—Edmund White, in the course of determining the purity and strength of the materials employed in an investigation dealing with "Aromatic Spirit of Ammonia," examined a large number of samples of "strong solution of ammonia," which is officially required to contain 32.5 per cent. by weight of NH_3 with a specific gravity of 0.891, but found the percentage of ammonia to be invariably lower than indicated under the official description. On consulting the literature on the subject, and particularly the investigations of Lunge and Wiernik, he found that solution of ammonia of specific gravity 0.891 should contain 31.4 and not 32.5 per cent. of NH_3, and this is practically confirmed by his own experiments, which were carried out as follows:

The specific gravities were obtained by means of a Regnault's bottle of ascertained accuracy. The solution of ammonia was poured rapidly into the bottle slightly above the mark in the neck, the bottle was immediately closed and immersed in water at 15.5° C. When the fluid had attained a constant level in the neck of the bottle its volume was rapidly adjusted and the bottle weighed. The ammonia was determined by placing 20 Cc. $\frac{N}{1}$ H_2SO_4 in a stoppered weighing bottle; the weight of this was determined, and a quantity of solution of ammonia of rather less than one gramme added. The stopper was immediately replaced, the contents mixed by rapid rotation and the bottle re-weighed. The fluid was then washed out and titrated back to neutrality by $\frac{N}{1}$ NaOH. The results in the appended table are averages of several closely agreeing experiments in each case:

	Sp. gr. at 15.5.	Per cent. NH_3 (M. W. 16.94).
Sample 1	0.8893	32.19
Sample 2	0.8902	31.85
Sample 3	0.8916	31.42

These figures closely agree with those in Lunge and Wiernik's table, especially if allowance be made for the difference of 0.5° C. in the temperature at which the specific gravities were determined.—Pharm. Journ., Feb. 17, 1900, 144.

Lime Water—Preparation.—Geo. E. Thum makes some practical observations on the preparation and preservation of lime water, operations which are usually conducted in the imperfect manner in which they have been conducted from time immemorial. The lime used shall be strictly pure oyster-shell lime, perfectly burned, and hermetically sealed, such an article being now on the market in two-pound cans. The contents of one of these cans should be placed in a mixing and decanting vessel, provided with a spigot above the bottom so as to give space for the undissolved lime. The vessel being filled with water after the lime has been slaked in it, mixture is effected, and the lime allowed to settle. The first water is drawn off and rejected. After filling, mixing and allowing to settle, as before, the water may be drawn off from the spigot as required, the vessel being carefully closed at all other times. Filtration should never be resorted to, since much of the lime is thereby exposed to the air and converted into carbonate. The water can be renewed for a long time, since the lime cannot deteriorate, every source of air being cut off (except that introduced when drawing the water!—Rep.).—Proc. New Jersey Pharm. Assoc., 1899, 59.

Lime Water—Unsatisfactory Condition in Pharmacies.—Pierce P. Bear, in view of the statement that not one sample of lime water in ten answers the pharmacopœial requirements, examined fifteen samples obtained from different pharmacies, and found that none of them answered all the requirements. Some were fairly good, but the majority were very poor, some containing scarcely any calcium hydrate and others considerable quantities of other soluble alkali. The results are shown in a table which may be consulted in the original paper. The author finds it advisable to slack the lime with hot water, and to throw the first water so obtained away. The residual washed lime may then be treated with cold water, as officially required. The use of hot water has the advantage that it dissolves the objectionable constituents of the lime better than cold, and that the calcium hydrate is less soluble in hot than in cold water. Filtering the lime water is more of an advantage than disadvantage, as is generally supposed. Suspended carbonate is completely removed, and only a trace

of calcium hydrate is lost if filtered through dry paper. — Proc. New Jersey Pharm. Assoc., 1899, 49.

Solution of Sodium Arsenate, B. P.—Incompatibility with Solution of Strychnine, B. P.—Thomas Dunlop calls attention to the precipitation of a portion of strychnine, amounting to fully 28 per cent. of the entire quantity, when recently dispensing a prescription of equal quantities of liq. sod. arsen. and liq. strychn., both prepared according to the B. P. 1898. Not having observed this incompatibility with liq. strychn., B. P. 1885, it occurred to him that the excess of acid in that solution would have been sufficient to neutralize the alkalinity of the arsenical solution, and experiment proved this to be so. He finds that if two and a half minims of diluted hydrochloric acid are added to a fluid ounce of liq. sod. arsen., a faintly acid solution is produced, and this is compatible with liq. strychn. hydrochlor., B. P. 1898. This observation suggests an amendment of the formula for making liq. sod. arsen.; but, in the meantime, its incompatibility with hydrochloride of strychnine should be noted by dispensers. Although it has been stated that the alkalinity of the arsenical solution is probably due to partial hydrolysis of the sodium arsenate when it enters into solution, the author is of the opinion that the sodium hydroxide is present as an impurity in the salt, and may be a variable quantity.—Pharm. Journ., Dec. 23, 1899, 604.

Referring to the foregoing observations of Mr. Dunlop, J. Rutherford Hill contributes an exhaustive paper, in which he details the results of his own investigations concerning the causes of the incompatibility noted. In view of the process for making sodium arsenate, sodium oxide as an impurity is improbable. The presence of sodium carbonate as a contamination is, however, not excluded by the process of manufacture: but the presence of this is easily detected, and the sodium arsenate, moreover, would not conform to the pharmacopœial tests. A salt used in his experiments, which acted in the same way as Mr. Dunlop reports, gave not the slightest indication of effervescence, notwithstanding that 1 part of Na_2CO_3 in 1000 of dried Na_2HAsO_4 could be distinctly detected by effervescence. From his studies and experiments the author is inclined to the theory that sodium arsenate, in common with sodium phosphate, undergoes hydrolysis in aqueous solution, and that the tendency is to evaporate into dihydrogen arsenate (respectively phosphate) and sodium hydrate. But the most surprising observation made by Dr. Hill is that if the mixture of the two solutions prepared according to the official requirements (B. P., 1898), is allowed to stand twenty-four hours, or even less, the whole of the strychnine will be crystallized out. It does not seem necessary to assume that there is any prior hydrolysis in aqueous solution. It is well-known that mineral acids in combination with alkaloids behave like free acids towards the fixed alkalies. The instability of the Na_2HAsO_4 in solution, and the loose attachment of the HCl in the strychnine hydrochloride, results in a double de-

composition, explained by the following equation: $Na_2HAsO_4 + C_{21}H_{22}N_2O_2HCl = NaH_2AsO_4 + NaCl + C_{21}H_{22}N_2O_2$. An analogous experiment made with a one per cent. solution of quinine hydrochloride and sodium arsenate solution gave an immediate precipitate, almost making the liquid solid by the bulkiness of the quinine, which dissolved readily in ether.—Ibid., Jan. 20, 1900, 45–46.

In continuation of the foregoing inquiry concerning the mutual decomposition of sodium arsenate and strychnine hydrochloride in solution, Mr. Hill mentions that his attention having been called to the stability of potassium arsenate (which see, under "Inorganic Chemistry"), by Mr. John Lothian, he has made experiments which conclusively show that a 1 per cent. solution of potassium arsenate will form a permanently clear and stable mixture with an equal volume of the official (B. P.) solution of strychnine hydrochloride, or with a 1 per cent. solution of the latter salt containing no alcohol. The author therefore concludes that a 1 per cent. *Solution of Potassium Arsenate* might advantageously be admitted into the B. P. in place of the non-official solution of sodium arsenate. Indeed, he thinks that it might be admitted to the exclusion also of the other two 1 per cent. arsenical preparations now official, viz., "liquor potass. arsenitis," and "liquor arsenici hydrochlor.," the greater potency of the arsenous preparation over the "arsenate" being readily adjusted by increasing the dose.—Pharm. Journ., Feb. 24, 1900, 184.

Liquor Bismuthi et Ammonii Citratis—Modification of B. P. Formula and Manipulation.—Frank R. Dudderidge has frequently experienced trouble to effect the solution of the bismuth citrate in ammonia when carrying out the process of the B. P. for liquor bismuthi et ammonii citratis. He has since adopted a method with satisfactory results which differs from the official method only in the following respects: 1. The solution of bismuth oxynitrate in equal volumes of nitric acid and distilled water is *not* diluted to opalescence, it is not diluted at all; 2. The order of mixing is reversed, the potassium salts not being added to the bismuth, but the bismuth solution poured carefully into the solution of the potassium salts, which is kept stirred constantly; 3. The potassium salts are dissolved in a definite quantity of water, viz., 100 Cc. for a liter of product. This forms a thick magma, to which another 100 Cc. of water are added (after adding the bismuth solution,? Rep.), heated to the boiling point, thrown on the filter, and (the precipitate) washed with hot water until free from nitrate contamination, when it is easily soluble in liquor ammoniæ. The author also finds that if the quantity of potassium carbonate is increased from 20 to 27 grammes, the washings are practically neutral, and very little if any loss of bismuth results. Furthermore, the author considers it an advantage if the amount of ammonium citrate is increased, and suggests that in a future revision 400 Cc. of liquor ammonii citratis be substituted for an equal volume of water when making a liter of the preparation.—Trans. Brit. Pharm. Conf., 1899, 451–453.

Liquor Bismuthi, B. P.—Satisfactory Modification of Formula.—R. C. Cowley and J. P. Catford discuss some of the difficulties that have been encountered in preparing liquor bismuthi, which has been official in the B. P. since 1867, and variously modified under the revisions since then. Even the formula of the B. P., 1898, which directs the preparation of a bismuth citrate and its solution while still moist in solution of ammonia, is not free from objection, the principal difficulty being to wash the precipitate free from nitric acid, and when so washed to dissolve it completely in solution of ammonia. In the experience of the authors, based upon experiments recorded in the present paper, the difficulty is overcome by careful attention to certain details, viz., to employ the exact quantity of alkali or alkaline carbonate necessary to neutralize the nitric acid used to dissolve the bismuth oxynitrate, plus the quantity of nitric acid in the latter; to dilute the magma of bismuth citrate obtained in the process with a certain quantity of *hot* water; to allow the mixture to become cold before collecting the citrate on a filter, and then to wash it until free from nitrate, when it may be dissolved on the filter by the prescribed quantity of liquor ammoniæ suitably diluted. It is immaterial whether potassium or sodium bicarbonate, or whether the subcarbonates or hydrates of these alkalies are employed as precipitants of the citrate; but in the latter cases solutions of the subcarbonates or hydrates must be made and carefully adjusted to the nitric acid contained in the solution of the bismuth oxynitrate and citric acid, directions being given for this purpose. The bicarbonates, however, may be weighed as pure, being fairly constant in purity, and the working formula proposed by the authors may therefore be briefly given as follows:

Bismuth oxynitrate (subnitrate, U. S. P.)	70 Gm.
Nitric acid (sp. gr. 1.42),	
Distilled water, of each	50 Cc.
Citric acid	50 Gm.

Dissolve the bismuth in the nitric acid, previously diluted with the water, by gently warming, and add the citric acid previously dissolved in a little water. To this solution add gradually, stirring well,

Potassium bicarbonate	103.0 Gm.

or,

Sodium bicarbonate	86.5 Gm.

dissolved in sufficient water; then dilute with *hot* water to about a liter, cool, filter and wash free from nitrate. Pour on to the citrate 60 Cc. of liq. ammon. (10 per cent.) diluted to 200 Cc. with water; return filtrate until the bismuth citrate is taken up; then dilute it to a liter or to the required specific gravity = 1.07.

Operating in this way, the precipitated bismuth citrate is in a granular compact state, holds comparatively little water, the filtrate passes bright,

does not deposit, as it would if filtered while warm, and does not require much more water to free it from nitrate beyond that necessary to displace the original liquid, while the loss in bismuth is not more than 1 per cent. of that used.—Pharm. Journ., Dec. 23, 1899, 604–605.

Ferric Solutions—Proposed Preparation with Hydrogen Dioxide.—Francis Hemm points out that the cost of the official ferric solutions is not materially increased if hydrogen dioxide is used in place of nitric acid for oxidizing the ferrous salts, as was suggested some ten years ago, when hydrogen dioxide was much more expensive than it is to day. The process could then be conveniently carried out by the pharmacist, as it should be, and there would be no necessity for a fume chamber to carry off the nitrous fumes.

Solution of Ferric Chloride, instead of being prepared by the direct action of hydrochloric acid upon metallic iron, giving off a strong and disagreeable odor, might be made by dissolving freshly made ferric hydrate in the proper proportion of pure hydrochloric acid.—Amer. Drugg., March 29, 1900, 199.

Liquor Ferri Perchloridi Fortis, B. P.—Discrepancy between Formula and Requirement.—F. C. J. Bird calls attention to the fact that when the B. P. process for preparing liq. ferri perchlor. fortis is strictly adhered to the final product will contain a quantity of ferric chloride corresponding to 1.44 Gm. Fe_2O_3 per 5 Cc. instead of 1.6 Gm. required. The specific gravity—about 1.42—also does not conform to a solution yielding 1.60 Gm. ferric oxide per 5 Cc., such a solution having the sp. gr. 1.488 at 15.5° C. To obtain such a solution the formula must be modified on lines pointed out by the author.—Trans. Brit. Pharm. Conf., 1899, 361–362.

Dialyzed Iron — Improved Method of Preparation.—Willy Wobbe recommends the following method for preparing dialyzed iron: Five parts of solution of ferric chloride of sp. gr. 1.240 are placed in a capacious earthen or porcelain vessel, which should be placed in cold water during warm summer temperature, and 3 to 3.5 parts of solution of ammonia are added in small quantities at a time, stirring regularly and vigorously during each addition, and awaiting the resolution of the precipitates formed before adding the next portion of ammonia. The stirring is continued for a short time after the last portion of ammonia has been added and resolution of the precipitate is effected, when the liquid may be placed upon the dialyzer. The water is renewed thrice daily, until it no longer assumes a brown color, is not acid to litmus, and gives but a very faint reaction with silver nitrate after acidulation with nitric acid. The dialyzation of 5 kg. in this way will require about one month, The clear dialyzed iron solution so obtained has a deep brown-red color and is nearly devoid of ferruginous taste. It is finished by evaporation to a sp. gr. of 1.05, and then contains 5. per cent. of ferric oxide, equivalent to 3.5 per cent. metallic

iron. It is not colored by either potassium ferrocyanide or tannic acid, though rendered turbid by these reagents, while potassium sulphocyanide in solution of 5 parts of the dialyzed iron and 100 parts of water changes the color to a lighter yellow, instead of the deep red color characteristic of ferric salts.—Pharm. Centralh., Dec. 21, 1899, 793.

Liquor Ferri Albuminati — Improved Method of Preparation. — Sifting out the most essential points from the most reliable of the numerous formulas and methods that have been prepared for the preparation of solution of albuminate of iron, the following general method is found to be the most trustworthy: The albumen is dissolved in previously boiled distilled water, the temperature of which must not exceed 45°; this is mixed with the ferric chloride solution, and the mixture exactly neutralized. The precipitate produced is then washed with water at 30° to 35°, until the washings cease to give the chlorine reaction, and, while moist, dissolved in diluted sodium hydrate solution, avoiding heat. Dieterich and Barthol recommend a solution of sodium hydrate as dilute as possible, and in which a part of the sodium is saturated with citric acid, their formula being as follows: To 120 Gm. solution of ferric chloride diluted with 4 kg. of distilled water at 50° C., solution of albumen is slowly added, stirring. Solution of sodium hydrate of sp. gr. 1.17 (about 3 Gm.) diluted with 20 times its weight of water, is added, the precipitate allowed to settle, and washed with water at 50° until free from chlorine, and collected on a moist strainer. The completely washed precipitate is next transformed to a wide-mouth bottle, 5 Gm. of soda solution of sp. gr. 1.17 added, and stirred until solution is effected. Now dilute 150 Gm. of alcohol (90 per cent.) and 2 Gm. of aromatic tincture with 100 Gm. of cinnamon water, and sufficient distilled water to make, on addition of the concentrated solution of albuminate of iron, 1000 Gm. of finished product. If sweetening is desired, Dieterich recommends the substitution of an equivalent quantity of water by 150 Gm. of simple syrup, and the addition of 1 Gm. of marasquino. The solution may also be prepared from the dry soluble albuminate of iron (containing sodium citrate?—Rep.*). This requires 20 Gm. of the albuminate (containing 20 per cent. Fe), 8 Gm. of solution of soda, sp. gr. 1.17, diluted with 780 Gm. distilled water. After standing 24 hours, 150 Gm., 90 per cent. alcohol, 100 Gm. cinnamon water, and 2 Gm. marasquino are added to the nearly clear solution. Finally, E. Dieterich's formula for

Liq. Ferri Albuminati "Drees," is as follows: 28 Gm. ferri album. c. nat. citric. are dissolved in 770 Gm. water, and 75 Gm., 90 per cent. alcohol, 100 Gm. cognac, 1.5 Gm. tinct. zingib., 1.5 tinct. cinnamon, and

* It will be noticed that sodium citrate, or the addition of citric acid to the soda, is not mentioned in the formula, though it is apparently a component of the "soluble" albuminate of iron.—Rep.

1.5 Gm. tinct. galang. are added to the solution. If required sweet, 150 Gm. syrup and 1 Gm. marasquino may be added in place of the corresponding quantity of water, and the three tinctures are omitted. After mixture is effected in either case, the solution is allowed to stand 24 hours and decanted from the small flocculent deposit.—Pharm. Ztg., Dec. 17, 1899, 704.

Liquor Ferri Albuminati—Determination of the Iron Content.—O. Linde reviews the methods proposed at different times for determining the amount of iron in liquor ferri albuminati, by E. Holdermann, W. Grüning, H. Bornträger, C. Meinecke, E. Bosetti, E. Lüttke, L. van Itallie, C. Schacht and E. Dieterich. He finds the method of Lüttke to be the most suitable, under certain modifications, the modified process being as follows:

20 Cm. of the solution are mixed in a 100 Cc. flask with 20 Cc. of water, and 3 Cc. of diluted sulphuric acid (1 + 5); the mixture is heated on a water bath until the brown precipitate at first produced becomes whitish, when the contents of the flask are allowed to cool, brought to the volume of 100 Cc. with water, well mixed and filtered. Of this filtrate 20 Cc. are treated with potassium permanganate solution, added drop by drop, until it remains transiently red, and when completely colorless, if necessary by the addition of a few drops of alcohol, it is allowed to stand for an hour at the ordinary temperature in a glass stoppered flask with 2.5 to 3 Gm. of potassium iodide. The iodine thus separated is titrated with $\frac{N}{10}$ sodium thiosulphate solution, of which 2.7 to 2.8 Cc. should be required—this corresponding to from 0.378 to 0.392 per cent. of iron.—Apoth. Ztg., June 23, 1900, 422–424.

Solution of Pepto-Manganate of Iron—Formula and Manipulation.—John E. Groff recommends the following formula for preparing solution of pepto-manganate of iron, a preparation widely known under several other names, but differing little in composition:

1. Dissolve 40 Gm. citric acid in 500 Cc. of distilled water, and neutralize the solution with C. P. ammonia water.

2. Dissolve 96 Gm. of iron peptonate, *as fresh as possible*, in 500 Cc. of distilled water.

3. Dissolve 14.8 Gm. of manganese chloride in 500 Cc. of distilled water.

4. Add 30 Cc. of tincture of sweet orange peel, 15 Cc. of tincture of vanilla and 10 Cc. of spirit of cinnamon to 500 Cc. of brandy, then add 500 Cc. of distilled water. Mix, and clarify by filtration with precipitated calcium phosphate.

5. Place 1500 Cc. of distilled water into a suitable container, and add the solutions above indicated successively in the order in which they were obtained, shaking after each addition. The result is a clear, stable compound, which has been dispensed by the author with satisfaction in the

Rhode Island Hospital, and has been kept through several seasons without undergoing change.—Bull. Pharm., Sept. 1899, 367.

Solution of Glycerophosphate of Calcium—Preparation.—P. Carles proposes to make solutions of glycerophosphate of calcium by converting the neutral, insoluble salt into the soluble acid salt, removing for this purpose half an equivalent of calcium from the neutral salt by means of oxalic or tartaric acid: Suspend 10 Gm. of neutral calcium glycerophosphate in 80 Cc. of water at 40° to 50° C., add 2.25 to 3 Gm. of oxalic acid, or (better! Rep.) 2.75 to 3 Gm. of tartaric acid, shake the mixture, and filter after standing 2 hours. Add 5 Gm. of cherry laurel water to the filtrate, and pass sufficient water through the filter to make 100 Gm. The cherry laurel water may be substituted by cinnamon water, both being added to avoid fungoid growths in the solution. An excellent

Syrup of Glycerophosphate of Calcium is obtained by dissolving 160 Gm. of sugar in 100 Gm. of the above solution either in the cold or on a water bath. A

Wine of Glycerophosphate of Calcium may be prepared by following the same general directions as for making the solution, but it is made of the strength of 10 Gm. to 1000 Gm. of finished product, using any good wine for this purpose. About two-thirds of the wine is used initially, and the remainder used for washing the precipitated calcium salt. If oxalic acid is used instead of tartaric acid, the wine will be less apt to deposit acid potassium tartrate on keeping.—Pharm. Journ., Sept. 9, 1899, 252; from Bull. de Pharm. de Bord., *39*, 201.

Solution of Aluminum Boroformate—Preparation.—J. Martenson communicates the following method for preparing a solution of aluminum boroformate: A warmed concentrated solution of 100 parts of ordinary alum is precipitated with a very concentrated warmed solution of 83 parts of borax, the precipitated aluminum borate is well washed with distilled water until a reaction for sulphuric acid in the washings fails, and the product is then dissolved in slightly diluted formic acid, using sufficient to dissolve nearly all of it. After subsidence, the solution is filtered, and adjusted to a strength of 10 per cent. by evaporating an aliquot part of it.—Apoth. Ztg., May 16, 1900, 328; from Farmaz. Journ., 1900, 179.

Solution of Zinc Chloride—Preparation from Zinc Oxide.—The official process for solution of zinc chloride is complicated and troublesome, all for the reason that iron has to be removed from the zinc used. Francis Hemm therefore proposes the use of iron-free zinc oxide and C. P. hydrochloric acid as follows: Zinc oxide, pure, powdered, 300 Gm.; dissolve this in 840 Gm. hydrochloric acid, U. S. P., in a porcelain capsule, stirring with a glass rod. Allow to stand until cool, filter through white paper or glass, and evaporate the filtrate to 1000 Gm. The product contains the prescribed quantity, 50 per cent. of salt, has the sp. gr. 1.535 and a specific volume of 0.652.—Amer. Drugg., March 29, 199.

Liquor Thymoli Compositus—Formula Adopted in Canada.—The following formula, among others which are evidently identical with those of the National Formulary, has been adopted by Canadian pharmacists for a compound thymol solution: Benzoic acid, 10 Gm.; boric acid, 20 Gm.; borax, 10 Gm.; thymol, 2 Gm.; eucalyptol, 10 drops; oil of wintergreen, 10 drops; oil of peppermint, 6 drops; glycerin, 100 Cc.; alcohol (90 per cent.), 300 Cc.; water enough to make 1000 Cc. Dissolve the thymol and oils in the alcohol, the acids and borax in 600 Cc. of water, add to the latter the glycerin, and mix with the alcoholic solution. After standing 24 hours, filter through kaolin, and add sufficient water through the filter to make the required volume.—Chem. & Drugg., Sept. 9, 1899, 447.

Essence of Rennet—Formula.—The following formula for preparing a liquid rennet differs from those usually given in that certain spices are added: A calf's rennet is well washed and cut up small with a pair of scissors. Then 100 parts of salt, 500 parts of distilled water, 150 parts of alcohol, and 5 parts each of black pepper, cloves, and bayberries are added, and the whole is macerated for twelve days. It is finally filtered and preserved in brown glass bottles.—Pharm. Ztg., *44* (1899), 348.

Litmus Solution—Improved Method of Preparation.—N. K. Gutkowsky proposes the following method for preparing litmus solution: Litmus is extracted by heating it two or three times with 85 per cent.–90 per cent. alcohol, a half an hour each time; it is then washed with a little water to remove the alkalies that are not soluble in alcohol, and boiled with water for half an hour to exhaustion. The filtrate is saturated with carbonic acid and boiled not less than one hour, so that the bicarbonates may be decomposed. Diluted sulphuric acid is then added to the filtrate, observing that the solution shall maintain a distinct rose-red color by adding, if necessary, small quantities of diluted sulphuric acid. Finally, the rose-red liquid is divided into two equal portions. One of these is rendered distinctly blue with ammonia, the rose-red portion is then added, and the liquid is boiled to remove any excess of ammonia. It is again filtered, and diluted with water to make 10 parts from 1 part of litmus originally taken. The solution may be preserved by the addition of alcohol or a minute quantity of thymol.—Apoth. Ztg., Aug. 30, 1899, 529; from Farmazeft, 1899, 652.

Nessler's Reagent—Improved Substitute for the B. P. Formula.—E. W. Lucas finds that Nessler's reagent, when made according to the B. P. requirement, reacts with *dilute* ammonia solution but slowly, and recommends the following formula, commonly used in water analysis, as being very much quicker, and indicating, after it has been kept for a few weeks, 0.0001 Gm. NH_3 per gal. at once:

Potassium iodide	35 grammes.
Mercuric chloride	13 grammes.
Distilled water	500 grammes.

d add sufficient saturated solution of mercuric chloride to permanent red precipitate; then add 160 grammes sodium lved in 200 grammes water; shake well, add 10 Cc. more ution mercuric chloride, and make up to 1 liter with distilled er. This solution improves on keeping, but should be preserved in stoppered bottles protected from light.—Drugg. & Chem., Dec. 9, 1899, 959.

Saline Solutions for Injection in Infectious Diseases—Formulas.—The "Bulletin de la Societè de Pharmacie de Bordeaux" publishes the following formulas for certain saline solutions for injection in infectious diseases, which, as given in "Pharm. Journ." (Aug. 5, 1899, 141), are usefully reproduced here:

Luton's Serum.—Crystalline sodium phosphate, 4; sodium sulphate, 10; boiled distilled water, 100.

Hayem's Serum.—Pure sodium chloride, 5; pure sodium sulphate, 10; boiled distilled water, 1,000.

Surgical Serum.—Sodium chloride 7.5; boiled distilled water, 1,000.

Crocq's Serum.—Sodium phosphate, 2; boiled distilled water, 100.

Cantani's Serum.—Sodium chloride, 4; sodium carbonate, 2; boiled distilled water, 1,000.

Leclerc's Strong Serum.—Sodium chloride, 40; sodium phosphate, 5; sodium sulphate, 5; boiled distilled water, 1,000.

Cheron's Serum.—Crystalline phenol, 1; sodium chloride, 2; sodium phosphate, 4; sodium sulphate, 8; boiled distilled water, 100.

Latta's Serum.—Sodium chloride, 3 to 5; sodium carbonate, 1.7; water, 3,400.

Kronecker and Lichtenstein's Serum.—Sodium chloride, 6 to 7; sodium carbonate, 0.1; water, 1,000.

Schwartz's Solution.—Sodium chloride, 6 Gm.; solution of caustic potash and soda, 2 drops; water, 1,000 Cc.

Herard's Solution.—Sodium chlorate, 0.5; potassium chloride, 0.25; sodium phosphate, 1.26; sodium chloride, 4.5; distilled water, 1,000.

Dujardin-Beaumetz's Solution.—Sodium carbonate, 1; potassium sulphate, 1; sodium lactate, 1; sodium phosphate, 0.5; sodium chloride, 3.1; distilled water, 1,000.

Sapelier's Solution.—Sodium chloride, 60; potassium chloride, 5; sodium carbonate, 32; sodium phosphate, 1.5; potassium sulphate, 3.5; boiled water, 900.

Sydmann's Solution.—Sodium chloride, 6; sodium bicarbonate, 1; water, 1,000.

Matthieu's Solution.—Sodium sulphate, 6; sodium phosphate, 4; sodium chloride, 1; glycerin, 20 fluid parts; water, 100 fluid parts.

Huchard's Solution.—Sodium phosphate, 10; sodium chloride, 5; sodium sulphate, 2.5; distilled water, 100.

Renzi's Solution.—Pure iodine, 1; potassium iodide, 3; sodium chloride, 6; distilled water, 1,000.

Gelatin Serum—Formulas for Use as a Hæmostatic.—The "Petit Mon. Pharm." (*49*, 3303) observes that the value of gelatin as a hæmostatic is causing it to be freely prescribed, both as a local application and for hypodermic injection. For the latter purpose a one or two per cent. solution in artificial serum is generally employed. Thus, a general formula for hypodermic injection of gelatin is—Finest white gelatin, 10 to 20 Gms.; sodium chloride, 5 Gms.; pure sodium carbonate, 2 Gms.; distilled water to 1000 Gms. The solution should be thoroughly sterilized. For local application a stronger solution of pure white gelatin, 10 Gms.; sodium chloride, 10 Gms.; distilled water, 500 Gms. is employed. The gelatin in both cases is cut up small, and dissolved in the saline solution with a gentle heat, filtered through a Chardon filter, previously washed with hot distilled water, then filled into suitable flasks, plugged with cotton wool, and sterilized in the autoclave at a temperature of 100° C. Care must be taken not to exceed 105° C. during this sterilization, or the hæmostatic power of the gelatin will be destroyed. Sterilization may be effected in a water-bath, but in this case, great care is necessary to avoid deterioration of the coagulating properties of the gelatin.—Pharm. Journ., Aug. 26, 1899, 213.

LOTIONES.

Lotio Calaminæ—A Solidified Form.—Herbert Skinner recommends the following formula for preparing a solidified calamine lotion: Zinc oxide, 1 dr.; calamine, 1½ drm.; glycerin, 1 drm.; lime water, 2 fl. drams; glycerite of starch, enough to make 1 oz.—Pharm. Journ., June 9, 1900, 616.

Lotio Plumbi et Opii (Lead Water and Laudanum)—Formula of the Philadelphia Hospital.—This differs from the "Lotio Plumbi et Opii, N. F." It is made by adding to tincture of opium, 30 Cc., enough lead water to make 475 Cc.—Amer. Journ. Pharm., May, 1900, 233.

Liquor Picis cum Plumbo—Modified Formula.—Herbert Skinner recommends the following modified formula for the well-known "Liquor Picis cum Plumbo:" Liquor picis carbonis, B. P., ½ fl. oz.; liquor plumbi subacet., 80 m.; glycerin, enough to make 1 fl. oz. The addition of glycerin suspends the precipitate, and makes the preparation more soothing and cooling when it is applied diluted.—Pharm. Journ., June 9, 1900, 616.

Camphor Lotion—Efficient Formula.—Herbert Skinner has found the following lotion to be quite efficient in dermatological practice: Spirit of camphor, 2 fl. drms.; tinct. of benzoin, ½ fl. drm.; glycerin, ½ fl. oz.;

dist. water, enough to make 1 fl. oz. — Pharm. Journ. 9, 1900, 617; from Brit. Journ. Derm., May, 1900.

Lotion for Sweating Hands — Formula. — The following formula for a remedy for sweating hands is given in "Münch. Med. Wochenschrift" (1899, 1407): Boric acid, 5.0; borax, salicylic acid, of each, 15.0; glycerin, diluted alcohol, of each, 60.0. Mix. To be applied three times daily.—Apoth. Ztg., Oct. 25, 1899, 637.

Nail Lotion—Formula.—The "Petit Mon. Pharm." (*49*, 3315) gives the following formula for preparing, and directions for applying, a nail lotion: Sulphuric acid, 10; tincture of myrrh, 5; distilled water, 125. Moisten the nails night and morning with a little of this lotion on a piece of cotton wool, and polish them with a piece of chamois leather.

MISTURÆ.

Mixtures—Formulas of the Philadelphia Hospital.—The following formulas for mixtures have been adopted in the recently revised edition of the "Pharmacopœia of the Philadelphia Hospital:"

Mistura Astringens: Extract of logwood, 0.6 Gm.; arom. sulphuric acid, 0.6 Cc.; camphorated tinct. of opium, 1.2 Cc.; cinnamon water, ginger syrup, of each, enough to make 15 Cc. Dose: A tablespoonful.

Mistura Alterans Composita: Tinct. of prickly ash, 0.6 Cc.; fluid extract of lappa minor, fluid extract of phytolacca, fluid extract of stillingia, of each, 1 Cc.; compound fluid extract of sarsaparilla, enough to make 4 Cc. Dose: A teaspoonful.

Mistura Argenti Composita: Silver nitrate, 0.004 Gm.; chloroform water, enough to make 4 Cc. Dose: One teaspoonful.

Mistura Ammonii Carbonatis: Ammonium carbonate, 0.32 Gm.; mucilage of acacia, 6 Cc.; oil of gaultheria, 0.03 Cc.; oil of sassafras, 0.03 Cc.; peppermint water, enough to make 8 Cc. Dose: a dessertspoonful to a tablespoonful.

Mistura Ammonii Chloridi et Strychninæ: Ammonium chloride, 0.32 Gm.; strychnine sulphate, 0.002 Gm.; chloroform water, enough to make 4 Cc. Dose: one to two teaspoonfuls.*

Mistura Bromidia: Sodium bromide, 0.15 Gm,; ammonium bromide, 0.15 Gm.; potassium bromide, 0.32 Gm.; ginger syrup, 1 Cc.; water, enough to make 4 Cc. Dose: one to four teaspoonfuls.

Mistura Bromidiæ et Arsenicæ (Epileptic Mixture): Potassium bromide, 0.3 Gm.; sodium bromide, 0.5 Gm.; solution of potassium arsenite, 0.06 Cc.; peppermint water, 0.6 Cc.; compound infusion of gentian, enough to make 4 Cc. Dose: one to two teaspoonfuls.

—Amer. Journ. Pharm., May, 1900, 233.

* The larger dose contains one-sixteenth grain of the strychnine salt!—Rep.

Mistura Morphini "Stockes"—Formula of the Dresden Apothecaries' Society.—Morphine hydrochloride, 0.05 Gm.; cherry laurel water, 5.00 Gm.; almond syrup, 30.0 Gm.: mucilage of acacia, 30.0 Gm.; distilled water, 80.0 Gm.—Apoth. Ztg., April 11, 1900, 242.

Mistura Olei Ricini, B. P.—Modification of Official Manipulation.—W. A. Gregson calls attention to the inconvenience of the requirement to use mucilage of acacia for preparing the new official of the B. P., mistura olei ricini. Operating on one-fourth the B. P. quantity, he suggests to put 75 grains of powdered acacia in a dry mortar; now add, all at once, 6 fluid drachms of castor oil, then add 3 fluid drachms of water, and mix them intimately; having made them perfectly homogeneous, add the aqueous fluids in one fluid drachm or more quantities according to skill, care being taken to maintain uniformity. The product compares favorably with that obtained by the official process.—Pharm. Journ., July 15, 1899, 50.

Bromoform Mixtures—Danger from Separation of Bromoform.—Dr. C. E. Stokes reports an instance of the danger due to the separation of bromoform from an aqueous vehicle on standing, even when suspended by means of tragacanth, in which two children nearly lost their lives after taking a dose of whooping-cough mixture, which chanced to be the last in the bottle. After vigorous medical treatment, including the practice of artificial respiration in each case for an hour-and-a-half, both patients were saved.—Pharm. Journ., June 30, 1900, 687; from Brit. Med. Journ., June 3, 1900, 1340.

Trional Mixture—Formula.—Trional being soluble in twenty parts of fixed oil of almond, Pouchet and Brissemont suggest an oily emulsion as an agreeable means of administering the drug, made according to the following formula: Trional, 1 Gm.; oil of sweet almonds, 20 Gm.; sugar, 8 Gm.; acacia, tragacanth, of each, 20 Centigm.; cherry laurel water, 2 Gm.—Pharm. Journ., Feb. 17, 1900, 153; from Jour. de Pharm. d'Anvers, *56*, 16.

Standard Colic and Diarrhœa Mixture—Formula.—C. R. Meredith recommends the following formula for a "Standard Colic and Diarrhœa Mixture" for adoption by the North Dakota Pharmaceutical Association: Chloroform, 3 ozs.; tincture of opium, spirit of camphor, spirit of peppermint, tincture of capsicum, of each, 8 ozs.; alcohol, 13 ozs.; syrup, 48 ozs.—Proc. North Dakota Pharm. Assoc., 1899, 44.

MUCILAGINES.

Mucilage of Acacia — Preservation by Formaldehyde. — A. E. Hiss has tried various expedients for preserving mucilage of acacia, but finds nothing that will do as well as the addition of a few drops of formaldehyde (to the quantity obtained by the official formula ? Rep.) The addition of

so small an amount he regards as unobjectionable. — Bull. Pharm., Dec. 1899, 498.

OLEA.

Medicated Oils—Formulas of the Dresden Apothecaries' Society:

Oleum Jecoris Aselli Ferro-Iodatum.—Iodine, 4 parts, are triturated with cod liver oil, 40 parts, with addition of a little ether, and shaken in a flask with powdered iron, 2 parts, until all the iodine has entered into combination. The mixture is then brought to a total weight of 1000 parts by the addition of cod liver oil, and allowed to subside; then filtered. 100 parts contain nearly 0.5 parts of iron iodide.

Oleum Mentholi is prepared by dissolving 5 Gm. of menthol in 95 Gm. of olive oil.—Apoth. Ztg., April 11, 1900, 242.

Effervescent Fixed Oils—A New Form of Exhibition.—The idea of impregnating fixed oils for internal administration with carbonic acid was engendered by the observation that some of these oils are readily taken when emulsified with carbonated beverages. If cod liver oil, for instance, is supersaturated with carbonic acid, a strongly effervescent beverage is obtained, which, though retaining an oily taste, is free from the acrid taste of the oil. The prickling sensation produced by the carbonic acid appears to modify or completely destroy the sense of taste. In the same way castor oil, olive oil and others may be charged with carbonic acid, the operation being most successful in the degree in which the oils are refrigerated. Animal oils, such as cod liver oil, appear to absorb carbonic acid in larger proportion and with greater facility than vegetable oils, castor oil being the most difficult to impregnate. The method is employed industrially under a German patent.—Apoth. Ztg., March 21, 1900, 189, from Chem. Rev., 1900, 52.

Oleum Lini Sulfuratum—Proper Temperature of Reaction:—O. Langkopf observes that the experiments of Altschul on the compounds produced by heating sulphur and linseed oil together (see Proceedings,) cover the ground so completely that little can be added concerning the preparation of "baisam of sulphur." He, however, calls attention to working within certain limits of temperature, for when that of 160° C. is exceeded, it results in the production of caoutchouc-like products with the development of strong odor and violent frothing. By attaching a thermometer to the wooden paddle used as a stirrer the temperature of the mass is easily observed, and if 160° is not exceeded it is quite possible to complete the operation without danger of frothing over even when the kettle is three-fourths filled with the ingredients. In this way 1 kgm. of sulphur may be dissolved in 6 kgm. of linseed oil in the course of 1½ hours without inconvenience arising from bad odor. The product obtained at 160° has the consistence of a firm salve, whereas that obtained at higher temperatures is thick-liquid.—Pharm. Ztg., Feb. 28, 1900, 164.

OLEATA.

Oleate of Quinine— Quick Method of Preparation.—Prof. A. B. Stevens recommends the following method for quickly making quinine oleate when the free alkaloid is not available: Dissolve 34 parts of quinine sulphate in 350 parts of wat r with the aid of sufficient dilute sulphuric acid, then precipitate by adding ammonia water in slight excess. Agitate with a sufficient quantity of ether to dissolve the quinine. Remove the ethereal layer to an evaporating dish containing 75 parts of oleic acid. Drive off the ether by evaporation over hot water, remote from fire. Chloroform is an excellent substitute for ether, as it is a better solvent for quinine, and it may be evaporated directly over a water bath without danger from fire. The whole operation can be performed in a few minutes.

Oleates of all other alkaloids precipitated by ammonia and soluble in chloroform or ether may be made in a similar manner, varying the proportions of alkaloids according to the strength of the oleate desired.—Amer. Drugg., Dec. 26, 1899, 355.

OLEORESINÆ.

Oleo-Resins—Economical Preparations.—H. C. C. Maisch recommends the so-called Soxhlet extraction apparatus as the most suitable and economical for preparing the official oleo-resins. The apparatus is arranged in such a manner that a small quantity of ether is forced to do the extraction over and over again. The principal portion of this apparatus is the extraction tube; the lower end is smaller, and is connected securely to the receiver. The tube consists of tubes of different bore, one placed on top of the other, but there is no direct opening between them. Extending from the side of the narrower lower tube to within a short distance of the upper edge of the wide tube, and securely fastened to both, is a tube with wide bore, serving as a communication between the receiver and the upper portion of the apparatus, and through which the volatilized solvent is conducted. The vapor is condensed in a reflux condenser attached to the upper portion of the extraction tube. From here the liquid drops on the drug, which is contained in the wider portion of the tube and, after going through the powder, is brought to the receiver by means of a siphon attached to the other side of the tube, and which acts automatically. The whole operation being conducted on a water-bath, the use of only a comparatively small quantity of ether is necessary. When the extraction is completed, we have in the receiver a rather concentrated solution of the constituents of the drug, and the loss of solvent in a carefully conducted operation is only small and barely enters into the cost of the preparation. Our present Pharmacopœia recognizes six oleo-resins, viz.: Oleo-resin of male fern, oleo-resin of cubebs, the oleo-resins of capsicum, lupulin, pepper and ginger. Of the four last-named there are at least two

which are of importance commercially, being used principally as flavoring agents and to impart a certain pungency to liquors and preserves.—Alumni Rep., March, 1900, 49.

PILULÆ.

Pill Excipients—Composition Suitable for Different Medicinal Agents.—J. Cohn recommends the substances used with advantage in forming pills from the medicinal substances commonly prescribed in this form, as follows:

Acidum Carbolicum: Soap and licorice-root or althæa-root; soap, althæa-root and honey; licorice-root and licorice extract; flour, soap and glycerin; flour, honey and glucose; althæa-root, starch (or tragacanth) and glycerin.

Alkaloids are triturated with starch, sugar, milk-sugar, kaolin, etc., and massed with honey, syrup or glucose.

Aloes may be massed with water alone in a warm mortar, or with water and soap, or with extract of gentian. In the presence of resins, soap and honey are the best.

Ammonium Carbonate is best massed with tragacanth and glucose. Glycerin must be avoided.

Ammonium Valerianate: Starch and kaolin massed with honey or glucose; extract of gentian; extract of licorice and honey.

Balsam Copaiba: About $\frac{1}{16}$ of its weight of calcined magnesia and a little water. Kaolin, tragacanth and a little water. If magnesia is used, the addition of lanolin to the amount of about $\frac{1}{12}$ of the total weight of the mass prevents the pills from becoming hard and brittle.

Bromides and Iodides of the Alkalies: Kaolin and vaselin or lanolin; althæa root and honey; starch, tragacanth and honey.

Calomel: Starch, tragacanth and water; tragacanth and glycerin; kaolin and vaselin. Gum arabic is to be avoided, the pills becoming too hard. Glucose and honey are reducing agents, and therefore unsuitable.

Camphor: Soap and starch or althæa root, massed with honey or glucose; soap and a little alcohol; extract of gentian.

Chloral hydrate: Starch, tragacanth and honey or glucose; althæa root and licorice root, with tragacanth and glycerin; licorice root, extract of licorice and water.

Creosote: Soap 1 p., powd. licorice root 5 p., massed with fresh egg-white, flour and a little syrup; kaolin, extract of licorice and honey; soap, licorice root, extract of licorice, balsam of tolu, a little alcohol, and magnesia.

Creolin yields a good mass with kaolin alone.

Ergotin also should be massed with kaolin alone. Neither althæa nor licorice root is suitable, the pills becoming too large.

Eucalyptol.—Like creosote.

Extract of Male Fern: Powdered male fern, tragacanth and water.

Guaiacol.—Like creosote.

Iodoform: Gentian root and extract; licorice root and extract.

Lead Acetate.—The same as iodoform.

Methyl blue and Pyoktanin are triturated with a little vaselin and then massed with kaolin.

Oleoresins: Kaolin, flour and a little water; kaolin, tragacanth and honey.

Oils.—Like creosote.

Oil, Croton: Flour and a little water or syrup; bread-crumbs; kaolin and vaselin or lanolin; licorice root, tragacanth and honey or glucose.

Pepsin: Malt extract; extract of gentian; licorice root and extract.

Permanganate: Kaolin and vaselin or water. Roll in talc.

Phosphorus: Phosphorus is dissolved in carbon disulphide or chloroform, added to vaselin, agitated until the solvent is completely evaporated, and massed with kaolin: or

Phosphorated Oil may be massed with lanolin and althæa root.

Quinine: Tragacanth, 6 p.; glycerin, 50 p.; water, 70 p.; tragacanth with honey or glucose; tartaric acid with a little glycerin and water. Syrup and gum arabic are to be avoided.

Salts—Deliquescent: Canada balsam, kaolin and vaselin.

Salts—Scaled Iron: A little tragacanth with honey or glucose.

Tar: Althæa-root and magnesia; kaolin.

Terpineol: Like creosote.

Terpin Hydrate: Starch, tragacanth and honey or syrup; licorice-root, althæa-root and extract of gentian.

Valerianates; Extract of gentian; extract of taraxacum; glucose or honey alone.—Pharm. Ztg., March 21, 1900, 221.

Pills—Formulas of the Dresden Apothecaries' Society.—

Pilulæ Aloëticæ: Aloes, 10.0 Gm.; jalap soap, 6.0 Gm.; are made into 100 pills by the aid of alcohol.

Pilulæ Argenti Colloidale, Majores (for internal use) are made by massing 1.0 Gm. of colloidal silver and 10.0 Gm. of milk-sugar, with glycerin, and dividing the mass into 100 pills.

Pilulæ (*Granulæ*) *Argenti Colloidale, Minores* (for external use) are made in the same way, using, however, 5.0 Gm. of colloidal silver and only 2.5 Gm. of milk-sugar for 100 granules.

Pilulæ Asiaticæ: Arsenous acid, 0.1 Gm.; pepper, in fine powder, 2.0 Gm.; licorice-root, in fine powder, 5.0 Gm. Make 100 pills.

Pilulæ Cascaræ Sagradæ: Dry extract of cascara sagrada, 10 Gm.; cascara sagrada bark, in fine powder, 3 Gm. Make 100 pills and coat them with (ethereal? Rep.) solution of balsam of tolu.

Pilulæ Digestivæ "Dietrich." — Extract of aloes, 15 Gm.; medicinal soap, in powder, 9 Gm.: kermes mineral, 0.7 Gm.; oil of fennel, oil of anise, of each, 8 drops. Make into 100 pills.

Pilulæ Ferri Iodati "Blanchardii." — Powdered iron, 2 Gm., and distilled water, 4 Gm., are triturated in a porcelain mortar with iodine, 4 Gm., until the brown color disappears, and the mixture is then immediately massed with sugar, 4 Gm., althæa root, in fine powder, 2 Gm., and as much finely powdered licorice as may be necessary to form a pill mass of proper consistence. This is divided into 100 pills, which are rolled in powdered graphite and coated with ethereal solution of tolu.

Pilulæ Rhei. — Extract of rhubarb, 6 Gm.; rhubarb, in fine powder, 6 Gm. Make 100 pills.

Pilulæ Rhei Anglicæ.—Rhubarb, 4.5 Gm.; aloes, myrrh, soap, of each, 3.0 Gm., all in fine powder; oil of peppermint, 5 drops; theriac, 6.0 Gm. Mass and divide into 100 pills.—Apoth. Ztg., April 11, 1900, 242.

Pilulæ Ferri Carbonici Blaudii, Phar. Germ.—Modification of Formula.—Feodor Miehle recommends the following formula for Blaud's pills for adoption in the German Pharmacopœia: Ferrous sulphate, 1200; sugar, 400; glycerin, 350; calcined magnesia, 100; potassium carbonate, 600; sodium bicarbonate, 600. These are mixed in the order given, placed on a steam-bath, 1000 parts of water added, and the thin-liquid magma, after thorough stirring, evaporated to the consistence of a thick paste. After adding 30 parts of powdered althæa, the evaporation is continued until the mass begins to become granular, whereupon 170 parts more of powdered althæa are added, and, after removal from the steam-bath, incorporated so as to form a homogeneous mass, the total weight of which will be about 3000 parts after being beaten into a mass of pilular consistence with the addition, if necessary, of sufficient of a mixture of equal parts of water and glycerin. Pills prepared from this mass are permanent, easily soluble, and exhibit a green fracture upon breaking them. They are to be dried in a drying closet.—Apoth. Ztg., Dec. 9, 1899, 741.

Dragées de Protoxalate de Fer—Cognet's Formula.—The "Bull. de Pharm. de Sud-Est" gives the following formula for the French specialty known as "Dragée's de protoxalate de Fer Cognet:" Ferrous oxalate, 10.0 Gm.; quassiin, crystallized, 0.9 Gm. To be divided into 100 pills, which may be either silvered or sugar coated.—Pharm. Centralh., Nov. 9, 1899, 689.

Pills of Colloidal Mercury—Formula.—Dr. Oscar Werter recommends the preparation of the pills of colloidal mercury by one of the following formulas, as may be designated:

1. Colloidal mercury, 0.3 to 1.0 Gm.; white bole, glycerin, of each sufficient. Make 30 pills rolled out in powdered talc.

2. Ointment of colloidal mercury (see under Unguenta), 3.0 to 6.0 Gm.; white bole, a sufficient quantity for 30 pills, which roll out in powdered talc. The latter retain their soft consistence, and are easily disintegrated in water.—Pharm. Centralh., Oct. 5, 1899, 609.

Pilulæ Saponis Gynocardiæ—Formula.—Dr. P. G. Unna gives the following formula for preparing pills from Chaulmoogra oil soap (see *Gynocardia soap*, under "Sapones"): Gynocardia soap, 300.00; dissolve in distilled water, 200.0; incorporate with 200.0 suet mass (see below), and 100.0 infusorial earth, and divide into pills, each weighing 0.45 Gm. Coat them with keratine. Each pill contains 0.18 Gm. gynocardia soap (corresponding to 0.15 Gm. chaulmoogra oil). They have been used with good results in lepra, being given in daily doses of 10 pills. The "suet" mass,

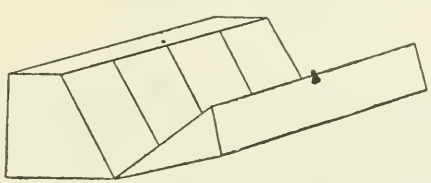
Massa Sebi, required in the above formula, is obtained by melting 500.0 Gm. crude beef suet and 100.0 Gm. yellow wax, straining, and adding a solution of 0.5 Gm. coumarin in 5.0 Gm. of alcohol.—Apoth. Ztg., Feb. 10, 1900, 100; from Mitth. f. prakt. Derm., 1900, 140.

Veterinary Physic Ball "Ticehurst's"—An Efficient Formula.—W. A. Dawson finds the following formula to produce a physic ball which acts promptly and thoroughly: Barbadoes aloes, 7 drams; jalap, gentian, ginger, calomel, of each, 1 dram. To be massed with glycerin and rolled out to a cylinder.—Amer. Drugg., Nov. 10, 1899, 259.

PULVERES.

Powder Papers—Convenient Case.—Joseph F. Hostelley describes the case for powder papers shown by Fig. 54, which has some advantages over the common counter drawer compartment. It is an elongated box, divided into several spaces to nicely accommodate powder papers of several sizes. The dimensions of the box will be governed by the ideas of

FIG. 54.



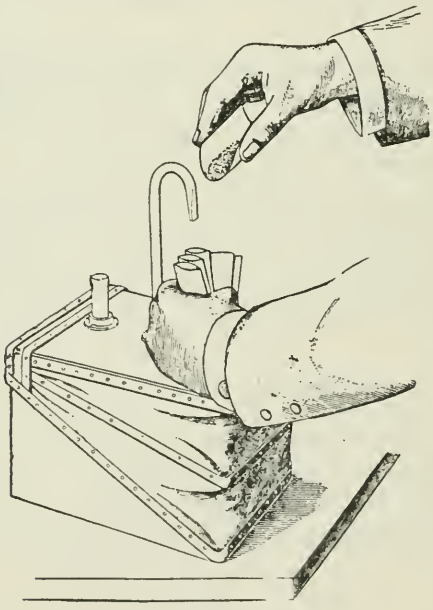
Convenient Case for Paper Powders.

the pharmacist. It might be made to hold three or four piles of papers. Being shallow, it will not encroach much on prescription counter room if left to stand on it, close to one side or just beneath a shelf, before the prescriptionist. The lid is to be secured when closed by a small spring

catch, easily released when the case is to be opened.—Drugg. Circ., Dec., 1999, 281.

Powder Paper Opener—Practical Construction.—The German journals are teeming with numerous devices for opening "ready folded" powder papers, which are used in the practice of German pharmacists for the direct introduction of the weighed portions of powders dispensed on prescriptions, the older way of opening them being to hold the folded paper —termed "capsule"—between the thumb and finger and blowing into the end by the mouth, a method which is open to objection on sanitary grounds. One of the best devices for this purpose is illustrated in the "American Druggist" (Jan. 25, 1900, 38) and here shown by Fig. 55).

Fig. 55.



Powder Paper Opener.

The operation of this apparatus is perfectly clear without any detailed description. As each powder is brought under the air tube the bellows top is depressed by the hand holding the folded papers and the air forced out causes the folded paper which happens to be immediately under the mouth of the tube to open.

Compound Powders—Formulas of the Dresden Apothecaries' Society:

Pulvis Calcariæ Compositus: Calcium phosphate, iron lactate, of each 12 ; orange peel, in fine powder, 6 ; prepared oyster shell, 24 ; milk sugar, 46 parts. Mix.

Pulvis Chinini Tannici Compositus: Quinine tannate, 2.5 Gm.; sodium bicarbonate, sugar, in moderately fine powder, of each 15 Gm. Mix.

Pulvis Dentifricius, "Jenkins"—Jenkins' Tooth Powder.—Calcium carbonate, 30 Gm.; orris root, in fine powder, 15 Gm.; medicinal soap, pumice, in fine powder, of each, 7.5 Gm.; oil of wintergreen, 8 drops. Mix.

Pulvis Dentifricius, "Pussinelli"—Pussinelli's Tooth Powder.—Calcium carbonate, 25 Gm.; Os. sepia, orris root, of each, 5 Gm.; myrrh, 2.5 Gm.; potassium chloride, 12.5 Gm. (all of them in fine powder); oil of peppermint, 6 drops. Mix.

Pulvis Dentifricius, "Spinner"—Spinner's Tooth Powder.—Calcium carbonate, 60 Gm.; magnesium carbonate, 4 Gm.; orris root, in fine powder, 2 Gm.: oil of peppermint, 6 drops. Mix.

Pulvis Galactopœus "Ph. Sax"—Nurse's Powder.—Finely powdered orange peel, moderately fine powdered fennel and sugar, of each, 20 Gm.; magnesium carbonate, 40 Gm. Mix.

Pulvis Inspersorius cum Bismuto Subgallico—

Bismuth Subgallate Dusting Powder.—Bismuth subgallate, 20; talc, in fine powder, 70; wheat starch, in fine powder, 10 parts. Mix.

Pulvis Inspersorius cum Tannoformo—Tannoform Dusting Powder.—Tannoform, 1 part, and finely powdered talc, 2 parts, are mixed together.

Pulvis Inspersorius cum Zinco Oxydato—Zinc Dusting Powder.—Equal parts of zinc oxide and finely powdered wheat starch.

Pulvis Inspersorius Zinco-Salicylatus—Zinc-Salicyl Dusting Powder.—Prepared by mixing 1 part of finely powdered salicylic acid with 99 parts of zinc dusting powder.—Apoth. Ztg., April 11, 1900, 243.

Ferrum Oxydatum Lactosaccharatum is the title of a preparation introduced by Arthur Hübler as a substitute for *Ferrum Oxydatum Saccharatum*, from which it differs in that the cane sugar is replaced by milk sugar.—Pharm. Ztg., Dec. 13, 1899, 889.

Granular Effervescent Magnesium Citrate—Should it be Replaced by a Corresponding Preparation of Magnesium Sulphate?—Wilbur L. Scoville says that it is frequently reported in pharmaceutical literature that magnesium sulphate is found in solution of magnesium citrate as an adulterant, but rarely does any one call attention to the almost universal existence of magnesium sulphate in the so-called granular effervescent citrate of magnesium. Yet true citrate of magnesium is seldom obtained, at least in New England, under this title. Nearly all of the so-called granular effervescent citrate of magnesium consists of an effervescent sulphate of magnesium or sodium. The United States Pharmacopœia, says the author, has embalmed the title and kept it before the profession, but the preparation itself has been defunct for more than a decade. The objections to

the official preparation are threefold : (1) it is not as nice appearing a preparation as its substitutes ; (2) it costs several times as much, and (3) it is difficult and tedious to prepare. The substitutes offered have been mostly magnesium and sodium sulphate, combined with citric or tartaric acid, sodium bicarbonate and sugar. Some have contained Rochelle salt, and some a mixture of this with magnesium sulphate. After discussing the question in various directions, the author point out that whatever may be said as to the virtues of magnesium citrate, the public has in effect declared its satisfaction with the substitutes and its unwillingness to pay the added cost in order to get the true preparation ; and the medical profession seem to have acquiesced in this decision.—Amer. Journ. Pharm., April, 1900, 175–177.

Tooth Powders—Formulas for Effective Preparations. — W. A. Dawson makes some practical observations on tooth powders and their preparation. He says, on looking over the multitude of tooth powder formulas found in formularies and journals, one must be struck with two things : First, there is a vast number of them, and secondly, very few of them are good for anything. A perfect tooth powder that will thoroughly clean the teeth and mouth need contain but few ingredients. For the base nothing is better than precipitated chalk. All gritty substances should be avoided, or should be used separately, as occasion may require for the removal of tartar, for which finely powdered pumice is the best. The addition of castile soap is advantageous for removing sordes or thickened mucus from the gums. Orris is unobjectionable, but answers simply as a flavor, and covers the taste of the soap. A little sugar or saccharin is also unobjectionable, since it gives a pleasant taste. Flavors should, as a rule, be added singly, the most popular probably being wintergreen, though the violet flavor of the orris also has its admirers, while in France and the European continent, peppermint is quite popular. The most popular is a

Saponaceous Tooth Powder, of which the following formula is the type : Precipitated chalk, 1 pound ; white castile soap, 1 ounce ; orris, 2 ounces ; sugar, 1 ounce (or saccharin, 2 grains) ; oil of wintergreen, ¼ ounce. A pink

Rose-Flavored Tooth Powder, once so popular in New York, is made in two styles, with and without soap, the formula being as follows : Precipitated chalk, 1 pound ; orris, 2 ounces ; sugar, 1½ ounces ; white castile soap, 1 ounce ; No. 40 carmine, 15 grains ; oil of rose, 12 drops ; oil of cloves, 4 drops. A good formula for

Violet Tooth Powder is the following : Precipitated chalk, 1 pound ; orris, 4 ounces, castile soap, 1 ounce ; sugar, 1½ ounces ; extract of violet, ¼ ounce ; evergreen coloring, R. & F., q. s. The chalk is first dyed to the requisite color, and the other ingredients then added.

Camphorated Tooth Powder is made by leaving out the oil of wintergreen in the first formula, and adding 1½ ounces of powdered camphor.

Carbolated Tooth Powder is made in the same way by substituting 2 drachms of liquefied carbolic acid for the oil of wintergreen. Finally, an

Antiseptic Tooth Powder is made according to the following formula: Precipitated chalk, 1 pound; castile soap, 5 drachms; borax, 3 drachms; thymol, menthol, eucalyptol, oil of wintergreen, of each, 20 grains; alcohol, ½ ounce. The latter is used to dissolve the thymol and oils, the solution being triturated with the chalk.—Bull. Pharm., August, 1899, 321–323.

Tooth Powders—New Formulas.—The following formulas for several useful tooth powders are recommeded in "Odontologie:"

Camphor Dentifrice: Camphor, 0.5; soap, 1.0; saccharin, 0.025; thymol, 0.05; calcium carbonate, 50 Gm.; oil of sassafras (or oil of wintergreen, or oil of cinnamon), 1 to 2 drops.

Violet Tooth Powder: β-naphthol, 0.05; saccharin, 0.025; soap, 1.0; calcium carbonate, 50.0 Gm.; ionone and oil of cananga (mixed in proportion of 15 : 1), 2 drops.

Astringent Tooth Powder: Myrrh, 1.0; sodium chloride, 1.0; soap, 0.5; calcium carbonate, 50.0 Gm.; otto of rose, q. s.

Menthol Tooth Powder: Menthol, 0.01; β-naphthol, 0.05; saccharin, 0.025; soap, 0.5; calcium carbonate, 50.0 Gm.; otto of rose, q. s.—Pharm. Journ., Dec. 2, 1899, 529; from Bull. de Pharm. de Brux., *43*, 270.

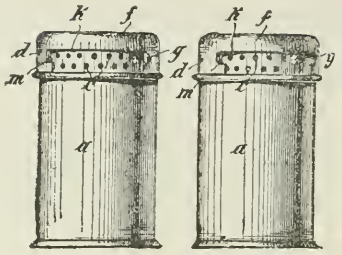
Boric Acid-Carbolic Dusting Powder—Formula.—Herbert Skinner finds a dusting powder with boric acid as the base to offer advantages over Fuller's earth and similar bases. It may be combined with a variety of antiseptics in modern favor, such as chinosol, izal, lysol, sanitas oil, creolin, etc. A carbolic dusting powder may be made by incorporating 56 grains of phenol. granul. (? Rep.) with sufficient very finely powdered boric acid to make 1 oz.—Pharm. Journ., June 9, 1900, 616; from Brit. Journ. Dermat., May, 1900.

Salicylated Talc Dusting Powder—Cause of Reddening and Prevention.—O. Langkopf finds that the dusting powder composed of talc, starch and salicylic acid is liable to acquire a red color on keeping. He finds this to be due to traces of iron, always present in the finest sorts of talc, which, owing to the presence of moisture, in the course of time reacts with the acid. Talc itself only contains about 0.25 per cent., and salicylic acid about 0.2 per cent., but starch contains as much as 9 per cent. By completely drying these constituents, the powder will retain its white color permanently; but it should be stored in tight containers.—Pharm. Ztg., Feb. 28, 1900, 164.

Foot Powder—Formula against Sweating.—The following formula for a foot powder is recommended for sweating feet in "Annales de Louvain:" Formaldehyde, 0.13; thymol, 0.10; oxide of zinc, 34.44; starch, 66.27. —Apoth. Ztg., Aug. 5, 1899, 469.

Dusting Boxes—New Construction.—Carl F. Reichelt has devised the powder duster shown by the accompanying cut (Fig. 56), which requires

FIG. 56.



Dusting Boxes.

little explanation. They may be constructed cheaply or expensively according to the selection of material, from wood, papier maché, sheet tin or aluminum, celluloid or rubber, and even glass or porcelain, and of any size, according to the intended use, such as the dusting of medicinal powders, insect powders, spices, and the like, the quantity of substance expelled being regulated by the number of openings exposed by turning the lid. When used as containers for transportation the lid is held in position by a strip of paper pasted over the joint.—Pharm. Post, Sept. 3, 1899, 479.

RESINÆ.

Scammony Resin—Ether Test not Infallible.—P. Guignes finds that the solubility of scammony resin in ether is not, as is generally supposed, a simple and reliable test of its purity, since the same sample of resin varies greatly in solubility with ethers from different sources. He finds that the chief cause of these discrepancies is the presence of alcohol and of water in the ether. Thus, scammony resin that was soluble in ether, sp. gr. 0.735, containing 15.5 per cent. of 98 per cent. alcohol, was much less soluble in absolute ether; while in a sample of pure ether, containing only 0.6 per cent. of water, 23.8 per cent. of the same resin was undissolved. Marked discrepancies were also noted in the solvent power of different specimens of ether having the same sp. gr., 0.720, and free from either impurity, but of different origin. Not only does the quality of the ether affect the solubility of the resin, but also the quantity of the solvent employed. Thus, after a clear saturated solution of scammony resin in ether is obtained, it precipitates, in most cases, on the further addition of the solvent.—Pharm. Journ., June 30, 1900, 687; from Journal de Pharm. [3], 11, 529.

Aletrin—Preparation and Properties.—Lewis Pugh has prepared and describes aletrin, the resinoid from *Aletris farinosa*, as follows: The coarsely-powdered rhizome is moistened with strong spirit (sp. gr., 828),

and, after standing for twelve hours, thoroughly exhausted with mount the menstruum, about 2 gallons being required for each pound of the ro taken. The resulting tincture, after recovery of the spirit by distillation, yields, on evaporation to dryness, about 9 per cent. of a dark-colored, almost dry, extract, too hygroscopic to reduce to powder. Of this rather more than one-half is soluble in water, the resulting true resinoid being of a dark golden-brown color, but not pulverizable. By the eclectics aletrin is said to have emetic and cathartic properties, and to be "the most powerful of uterine stimulants," and as such is used as a remedy for barrenness and to prevent abortion, whilst other authorities regard it as very little more than a simple bitter. The dose is from 1 gr. to 2 gr.—Chem. and Drugg., Sep. 30, 1899, 561.

Cimicifugin (*Macrotin*) — *Preparation, Yield and Properties.* — Lewis Pugh describes cimicifugin, also known as macrotin and macrotic acid, which he obtained by thoroughly exhausting the coarsely powdered root of *Cimicifuga racemosa* with spirit (sp. gr. 828) and, after recovery of most of the menstruum, by distillation and evaporating the concentrated tincture thus obtained to a creamy consistence. On pouring this into about twenty times its volume of water a yellowish resin is precipitated, which, after washing and drying, gradually darkens in color, and is readily reduced to powder of a brownish tint, possessing a marked odor, and a taste at first slightly sweet, afterwards very acrid and disagreeable, imparting a burning sensation to the throat. The average yield was found to be about 18 per cent. Cimicifugin is generally classed as an ecbolic, and by the eclectics was regarded as superior to ergot as a parturient. — Chem. and Drugg., Aug. 12, 1899, 299.

SAPONES.

Soap—Working Formulas for Official and Other Preparations.—M. I. Wilbert discusses methods by which some of the difficulties encountered when working the official and other preparations of soap may be overcome. Speaking of the official process for preparing

Sapo Mollis, he observes that conditions fully as favorable as those secured by following the official directions are secured by the addition of a certain small quantity of previously prepared green soap, with the advantage that the use of heat is avoided, and very little attention is required beyond occasional stirring, the process of saponification being practically spontaneous. Moreover, the risk involved in boiling the mixture over the open fire, the liability of spoiling a batch, is completely avoided. To 200 parts of alcohol, in a good-sized vessel, add 250 parts of green soap, allow it to dissolve, add 1250 parts of water and dissolve 450 parts of potassa (90 per cent.) in this mixture. Now gradually add 2000 parts of linseed oil, stirring constantly, so as to emulsionize it—this being facilitated by the green soap. Allow the emulsionized mixture to stand for an hour

y add 1000 parts of water, under constant stirring, to mulsion, and afterwards stir the mixture occasionally o prevent its separating, when it will be stiff enough her attention. In from 12 to 24 hours, depending on 1 making the emulsion and to some extent also on the room, saponification is completed. Adopting practi- um Saponis Mollis" of the Pharmacopœia as a basis

101 a

Liquid Antiseptic Soap, the author suggests the following formula: Green soap, 1500 p.; alcohol, 700 p.; water, 50 p.; cresylic acid, 100 p.; carbolic acid, 50 p. This has been in use in the German Hospital, Philadelphia, for several years, and has found much favor with the surgeons and others.

Cresol Emulsion is another preparation which has found much favor in the hospital named, being used as a substitute for the proprietary "Lysol." The formula is as follows: Green soap, 250 p.; resin soap — made with common resin — 100 p.: alcohol, 150 p.; cresylic acid, 450 p. This is used as an antiseptic in solution from 1 to 5 per cent., for cleaning instruments, utensils, etc., and as a cheap and most efficient general disinfectant.

Liquid Soda Soap is a convenient stock solution for preparing soap liniment of practically official composition. For this, also, a portion of previously prepared liquid soda soap is used to facilitate saponification, though it is not essential, saponification resulting readily without it. To 200 p. of liquid soda soap, in a large bottle, add 250 p. of alcohol and 750 p. of water; shake well, add 175 p. of sodium hydrate (90 per cent.), and, when solution is effected, gradually add 1125 p. of cotton seed oil, shaking or stirring the mixture constantly. Finish, by adding 1000 p. of alcohol, followed by 500 p. of water. From this stock solution

Soap Liniment is prepared as follows: Dissolve 360 p. of camphor and 80 p. of oil of rosemary in 5500 p. of alcohol, add 1600 p. of liquid soda soap, and finally, enough water to make 8000 parts.—Amer. Journ. Pharm., May, 1900, 212–215.

Sapo Mollis, U. S. P.—Modification of Manipulation.—The difficulties experienced by many pharmacists in making soft soap according to the official formula may be overcome, according to Prof. Wilbur L. Scoville, by manipulating as follows, using the U. S. P. ingredients and quantities: The alkali solution is divided into three equal portions. The first portion is mixed with the heated oil and allowed to boil or simmer 5 to 8 minutes, with frequent stirring. The second portion is added and heated in the same way 10 minutes; then the last portion is poured in, the heating and stirring being continued until a translucent greenish-yellow, jelly-like mass is formed, which is completely soluble in hot water. The entire operation

usually takes less than half an hour. It is important that the right amount of alkali be used.—Proc. Mass. State Pharm. Assoc., 1889, 56.

Green Soap—Convenient and Improved Method of Preparation.—E. Unger recommends the following method for preparing green soap as being more convenient and expeditious than that now official in the Germ. Pharm.: 400 Gm. of linseed oil are heated in a suitable vessel, and a mixture of 270 Gm. of 30 per cent. potassium hydrate solution and 40 Gm. of alcohol is added. Saponification is rapidly effected under continuous stirring, the soap being completed by the addition of 270 Gm. of water. The improvement is mainly in the use of a stronger potash solution in corresponding proportion, than that officially directed.

Spirit of Soap is expeditiously made according to the following simple method: 600 Gm. of olive oil are placed into a wide-mouthed flask with 350 Gm. of 30 per cent. potassa solution (sp. gr., 1.288) and 400 Gm. of alcohol, and the mixture is heated to about 30° C. with continuous and strong shaking. Saponification is completed in two or three minutes. The clear fluid when mixed with 2050 Gm. of water and sufficient alcohol to make a total weight of 6000 Gm., corresponds in all respects to the spirit of soap of the Germ. Phar. III. In a similar manner

Hebra's Spirit of Soap is obtained, the author's direction being as follows: 400 Gm. of linseed oil are saponified with 270 Gm. of 30 per cent. potassa solution and 400 Gm. of alcohol. When saponification is completed, 1930 Gm. of alcohol are added, and the 50 per cent. solution of green soap so obtained is perfumed with 3 Gm. each of oil of bergamot and oil of lavender.—Apoth. Ztg., July 1, 1899, 393.

Ether Soap—Formula and Advantages.—Edmund White communicates the following formula for preparing an ether solution of soft soap, which has been used with advantage for some time past in St. Thomas' Hospital, London, as a substitute for soft soap in cleansing and sterilizing the skin preliminary to more energetic treatment: Mix 35 Cc. of commercial oleic acid with 16 Cc. of alcohol in a flask, and drop in solution of potassium hydroxide, 1 in 1, until a neutral solution of soap is obtained, using phenolphthalein as indicator, about 7 Cc. of the alkali solution being required for this purpose; then add 0.1 Cc. of potash solution in addition, so that the reaction is just alkaline, allow to become cool, and finally add enough methylated ether to make 100 Cc. of finished product. This contains, in round numbers, 40 parts potassium oleate, 4 parts water, 16 parts 90 per cent. alcohol, and 40 parts ether. A slight deposit forms on standing, which may be removed by decantation. The method of using the soap is as follows: Pour on the surface to be cleansed sufficient of the solution to well moisten it—for the hands 5 to 10 Cc. is sufficient. Immediately rub it in vigorously and continue until the solvent is evaporated. Next moisten with just sufficient water to produce a thick lather, when the sur-

face is well rubbed and kneaded with the hands or a brush, finally rinsing with a copious supply of water. In this way the cleansing operation is confined to the area of operation, and the adjacent skin and tissues do not become tender.—Pharm. Journ., Sept. 23, 1899, 296.

Ethereal Solution of Soap — Convenient Extemporaneous Preparation. Herbert Skinner recommends the following formula for the extemporaneous preparation of ethereal soap solution: Oleic acid, methylated spirit, of each ½ fl. oz.; stronger solution of ammonia, a sufficiency; methylated ether, enough to make 2 fl. ozs. Mix the first two, add ammonia to neutralize, carefully avoiding an excess, then the ether, which may be increased so as to make 3 instead of 2 fl. ozs, if a weaker solution is required. The solution may be rendered antiseptic, not with mercuric chloride, but with the biniodide freshly prepared—that is, mercuric chloride dissolved in a strong solution of potassium iodide. — Pharm. Journ., June 9, 1900, 616; from Brit. Journ. Derm., May, 1900.

Ethereal Solution of Soap — Preparation. — John E. Groff prepares ethereal solution of soap by mixing equal parts of tincture of green soap and ether, allowing the mixture to stand until the clear solution separates on the surface of the water derived from the tincture, and then decanting. —Bull. Pharm., Sept., 1899, 368.

Spiritus Saponatus—Improvement of the Formula Proposed for the New German Pharmacopœia. — E. Laves finds that the characterization of spiritus saponatus given in the Ph. Germ. III., as well as in that prepared for the fourth revision, does not give evidence that the product is definite in its composition. Spiritus saponatus, in which 10 per cent. of the sodium hydroxide is still uncombined along with as much as 18 per cent. of unsaponified fat, will respond to the qualification—"a clear, yellow fluid having an alkaline reaction, and which is miscible with water and alcohol without turbidity" — quite as well as a perfectly saponified preparation. The proposition for the forthcoming Pharm. Germ. IV., to allow the saponification to take place by standing, without heat, is also inadvisable, since as shown by experiments described, the saponification is not completed before the lapse of two days; whereas, under certain modifications proposed by the author, saponification is completed by heating the mixture to boiling for one hour. He proposes that 20 Gm. of fused potassium hydroxide (90 per cent. KOH), dissolved in 20 Gm. of water, be mixed with 160 Gm. alcohol, and 100 Gm. olive oil, and heated for the prescribed time in a flask on the water-bath. The soap solution is then finished by adding 340 Gm. alcohol and 340 Gm. water. The alkali in this product is almost completely combined, not more than 0.6 per cent. at most remaining uncombined. Experiments made with other, cheaper oils, show that cotton seed oil answers quite as well as the more expensive olive oil.—Pharm. Ztg., May 9, 1900, 357.

Medicated and Glycerin Soaps—Formulas.—A practical and experienced soap maker gives formulas for a large number of medicated and glycerin soaps which are claimed to yield excellent results. The

Medicated Soaps almost invariably have as a basis a soap prepared with 60 kg. cocoanut oil and 30 kg. soda solution of 38°, a small portion of the latter being sometimes replaced by an equivalent quantity of potassa solution, while in a few instances the quantity of alkali solution is reduced by as much as 20 per cent. (in thymol soap) and 30 per cent. (salicylic acid soap). In addition to the medicinal ingredients some of the soaps are perfumed, others are not, the quantity of medicinal ingredients used in the above proportions being given in the following, the letter "p" after the indicated quantity signifying that the soap is perfumed: *Almond meal*, 4 kg., "p;" *Benzoic acid*, 4 kg., "p;" *Camphor*, 1 kg.; *Carbolic acid*, 1 kg. (crude, black); *Carbolic acid*, 1 kg. black; *Sulphur*, 2 kg., and *Wood tar*, 5 kg.; *Gall*, 6 kg.; *Ichthyol*, 4.5 kg.; *Lanolin iodine* (potassium iodide), 1 kg., "p;" *Lanolin*, 4 kg., "p;" *Lanolin*, 4 kg., and *Milk of sulphur*, 2 kg., "p;" *Naphthol*, 1 kg., "p;" *Peru balsam*, 1 kg., "p;" *Pumice*, 30 kg. (glycerin, 4 kg.), "p;" *Salicylic acid*, 1400 Gm.; *Sulphur*, 4 kg., "p;" *Sulphur* (milk of), 4 kg., "p;" *Sublimate* (corrosive), 1 kg., "p;" *Tannin*, 1 kg., "p;" *Tar* (wood), 7.5 kg.; *Tar* (wood), 4 kg., and *Sulphur*, 2 kg.; *Thymol*, 1500 Gm.; *Vaselin*, 4.5 kg., and *Tar* (wood), 4.5 kg.; *Vaselin*, 4 kg., *Tar* (wood), 4 kg., and *Sulphur*, 2 kg. It would take too much space to generalize the large number of formulas for

Glycerin Soaps.—As part of the perfumes must necessarily vary from the most delicate to the commonest, the material used for the soap stock varies very considerably according to the special soap to be made. The following examples may find place here:

1. Tallow, 40; castor oil, 30; cochin oil, 79: lye, (soda) of 38 per cent., 75; sugar, 45; water, 30; alcohol (96 per cent.), 45 kg.

2. Tallow, 30; cocoanut oil, 40; castor oil, 40; lye, 60; water, 32; sugar, 35; sugar-filler (see below), 40; alcohol, 30 kg.

3. Stearin, 8; tallow, 12; cocoanut oil, 20; castor oil, 12; lye, 26; glycerin, 12; sugar, 12; water, 8: alcohol, 18 kg.

3. Stearin, 8: tallow, 12; cocoanut oil, 20; castor oil, 12; lye, 26; glycerin, 12; sugar, 12; water, 8; alcohol, 18 kg.

5. Cochin oil, 36; premier jus., 18; castor oil, 10; lye, 38; sugar, 10; glycerin, 10; alcohol, 24 kg.

Sugar Filling is prepared as follows: 36 kg. of caustic potash (92–96 per cent.), 25 kg. of salt, 30 kg. of "crystal soda," and 40 kg. of sugar, are dissolved in 230 kg. of water.

The author concludes his very interesting paper by giving the details explaining various steps in the soap manufacture, such as the method of preparing the stock soap, the classification of fats, restoring rancid fats, preparation of "crystal-soda," alkali lyes, etc., which may be consulted with advantage in Pharm. Post, Dec. 3 and 10, 1899, 676–677 and 694.

Medicated and Medicinal Soaps.—Formulas of the Dresden Apothecaries' Society.

Sapo Calomelanos Mollis.—300 parts of almond oil are saponified with 50 parts of potassium hydrate solution and 100 parts of sodium hydrate solution under the addition of 30 parts of alcohol. 100 parts of the soap so obtained are then mixed with 20 parts of almond oil and 50 parts of calomel prepared by the aid of steam.

Sapo Glycerini Liquidus—Liquid Glycerin Soap.—40 parts of white potash soap (see below) are dissolved in 50 parts of glycerin, and mixed with 10 parts of alcohol.

Sapo Kalinus Albus—White Potash Soap.—100 parts of olive oil are saponified with 135 parts of potassium hydrate solution, with addition of 10 parts of alcohol, by the heat of a steam bath and with constant stirring.

Sapo Hydrargyri Mollis—Soft Mercurial Soap.—100 parts of mercury are triturated with a mixture of benzoinated suet, 7 parts, and benzoinated lard, 13 parts, until complete extinction of globules. This mixture is then incorporated with potash soap, 155 parts, and powdered domestic soap, 25 parts. The

Benzoinated Suet is made by digesting mutton suet with 5 per cent. of benzoin on a steam bath for one hour, and straining.—Apoth. Ztg., April 21, 1900, 270.

Superfatted Cod Liver Oil Soaps—Preparation. — Rhoden recommends inunctions with superfatted cod liver oil soap in advanced cases of pulmonary tuberculosis, either with or without the addition of other medicaments. It is obtained by preparing sapo kalinus in the usual way, using the finest hemp-seed oil for this purpose, so as to reduce the odor as much as possible. With this, from 20 to 40 per cent. of pure cod liver oil, as free from odor as possible, is incorporated, with the addition, under circumstances, of from 10 to 20 per cent. of a "lanolin-glycerin" mixture, appropriate quantities of ferrous iodide, balsam of Peru, etc. — Pharm. Ztg., Nov. 15, 1899, 815; from Therap. Monatsh., 1899, No. 11.

Tobacco Soap—A Remedy in Scabies.—A. Mentzel prepares "nicotiana soap," which is stated to contain 5 per cent. of tobacco extract (this containing 6.4 per cent. nicotine), 5 per cent. of precipitated sulphur, and 90 per cent. of superfatted soap, flavored with oil of bergamot. It is dark brown in color. Dr. Marcus has used the soap in 32 cases of scabies, which were cured in from 3 to 4 days by washing the affected parts, applying a lather prepared from the soap, and allowing to dry, night and morning. — Apoth. Ztg., Dec. 23, 1899, 776; from Therap. Monatsh., 1899, 663.

Gynocardia Soap—Formula.—Dr. P. G. Unna gives the following form-

ula for preparing a soap from chaulmoogra oil: 100 Gm. of oil of gynocardia are saponified with a lye composed of 175.0 Gm. of sodium hydrate and 750 Gm. distilled water, in a porcelain capsule on a water bath. The soap is then heated to near boiling over the direct fire with 2500 Gm. of distilled water, a solution of 300 Gm. of sodium chloride in 900 Gm. of distilled water is added, and the heat continued until the mixture boils. On cooling, the cake of soap formed is removed from the lye, washed with water, and freed from moisture by expression. The yield is from 1400–1500 Gm. — Apoth Ztg., Feb. 10, 1900, 99; from Mitth. f. prakt. Derm, 1900, 140.

Sapodermin—Composition.—Dr. A. Sack calls attention to the value of the mercurial soap, introduced under the name of "sapodermin," in the treatment of various skin diseases. The surfaces are coated with a lather prepared from this soap and the lather is allowed to become dry. It contains 1 part mercury in 500 parts, the mercury being present in the form of a soluble caseinate. The pure caseinate itself contains 6.9 per cent. of metallic mercury.—Apoth. Ztg., March 28, 1900, 210; from D. Med. Wchschr. (Ther. Beil.), 1900, 12.

SPECIES.

Species—Formulas of the Dresden Apothecaries' Society.

Species Laxantes "Schrammii:" Senna leaves, finely cut, 3; fennel, bruised, 2; anise, bruised, 1; red saunders, finely cut, 1 part. Mix.

Species Lini.—Linseed, whole, 8; fennel, bruised, 1; anise, bruised, 1; licorice root, cut fine, 2 parts. Mix.

Species Moldau.—Rhubarb, 3; calisaya bark, 2 parts. Each to be cut fine and then mixed.

Species Pectorales cum Fructibus.—Red poppy, cut, 1; star anise, bruised, 2; anise, bruised, 2; mullein flowers, cut, 2; orris root, finely cut, 4; pearl barley, 4; currants, 4; licorice root, cut, 6; colt's foot, cut, 8; marshmallow root, cut, 8 parts. Mix.

Species Pectorales Laxantes, prepared by adding to 3 parts of the preceding 1 part of senna leaves.

Species Resolventes.—Peppermint, melissa, sweet marjoram, thyme, of each 2 parts, chamomile, lavender flowers, elder flowers, of each 1 part. All cut fine and mixed.—Apoth. Ztg., April 21, 1900, 270.

SPIRITUS.

Spiritus Ætheris Nitrosi, B. P.—Deterioration under the Conditions of the Shop.—F. W. Pittuck and G. F. Merson have made a series of experiments in the same direction as those made by Mr. Barclay, but under conditions which aim more closely at those that obtain in the dispensing shop. A quart of freshly prepared standardized spirit of nitrous ether, B. P., was

placed in a stoppered bottle on a shelf, but not exposed to the sunlight, and quantities of half an ounce removed from time to time, sometimes night and morning, at others once a day, or on alternate days. Once a week the sp, gr. was taken, and the percentage of ethyl nitrite estimated —the latter corrected for temperature, pressure and vapor-tension. The results are shown in the following table:

FIVE CC. MEASURED AT 15.5° C.

The Volume of Nitric Oxide Corrected for Temperature, Pressure and Tension of Aqueous Vapor (0° *C.*, 760 *mm.*).

No. of Test.	Sp. Gr.	Volume of Nitric Oxide in Cc.	Corrected Volume.	Percentage Ethyl Nitrite.	Percentage of loss Ethyl Nitrite.
1	0.8375	33	31.82	2.552	—
2	0.8378	31	30.6	2.442	4.32
3	0.8380	28.8	28.43	2.28	10.66
4	0.8381	26.6	26.13	2.09	18.11
5	0.8383	24.5	23.5	1.88	26.34
6	0.8384	22	21.64	1.73	32.21
7	0.8386	21.6	20.76	1.66	34.96
8	0.8387	20.6	20.11	1.61	36.92
9	0.8388	19.6	19.4	1.55	39.27
10	0.8390	18	17.9	1.43	43.97
11	0.8390	15	15	1.2	53.1

Two 2 oz. bottles, corked and sealed, stored respectively (*a*) alongside the large bottle, and (*b*) in a dark cupboard, showed at the end of the three months very little deterioration. Compared with Mr. Barclay's results, the spirit dropped below the official minimum in a shorter period, due, no doubt, to the more frequent opening of the bottle, and to the larger quantities removed each time. It will be noticed from the table that by the end of the sixth week the spirit is below par, and that, too, in the most favorable season of the year for stability.—Ibid., Feb. 17, 1900, 282.

Spirit of Nitrous Ether—Alcoholic Strength a Factor in Preservation. — Prof. Wilbur L. Scoville reports the results of experiments made on spirit of nitrous ether, by I. E. Stacy, using alcohol of different strengths, and following the process recommended by him in a previous paper. Mr. Stacy found that the spirit keeps well for three months if protected from the light. The strength of the alcohol used for its preparation is also an important factor. Made with absolute alcohol, its strength was reduced during 10 months from 3.86 to 3.44 per cent.; with 92.5 per cent. alcohol, from 3.91 to 3.15 per cent.; with 91 per cent. alcohol, from 3.88 to 3.11 per cent. in an amber bottle, and to 2.04 per cent. in a flint bottle.—Proc. Mass. State Pharm. Assoc., 1899, 53.

Aromatic Spirit of Ammonia, B. P.—Correction of Official Requirements.—Edmund White communicates a very interesting paper on the Aromatic Spirit of Ammonia, B. P. 1898, in which he incidentally reports on the official requirements concerning the strong ammonia water and ammonium carbonate (which see under their respective headings) directed for preparing the spirit, in their relation to these products as found on the market. In two experiments, in which particular care was exercised in the determination of the specific gravity of the alcohol employed (viz. 0.8341), the specific gravities of the products were found to be, on an average of three determinations in each case, 0.8921 and 0.8914 respectively. The author, however, devotes the greater part of his paper to the official requirements concerning the total alkalinity and proportion of carbonate in the spirit. He has shown that both the solution of ammonia and the carbonate as obtainable fall slightly below the official requirement, the latter, as regards the strong solution of ammonia, being evidently based on error, while the carbonate at best contains but 96 per cent. of the required amount of ammonia, and may fall as low as 91 per cent. in apparently good, translucent samples. The official test of alkalinity requires that 20 Cc. of the spirit neutralize 25.5 Cc. of $\frac{N}{1}$ H_2SO_4; but if the official standards for the ammonia compounds be accepted, this quantity should neutralize 26.5 Cc., for even the calculated maximum neutralizing power of the author's figures is 26.2 Cc., while the calculated minimum neutralizing power is equal to 25.3 Cc. of $\frac{N}{1}$ H_2SO_4. It is evident, therefore, that in the official requirement an allowance is made for some loss of ammonia during process of manufacture, which in the author's experience amounts to a neutralizing power of 0.3 to 0.4 Cc. of $\frac{N}{1}$ H_2SO_4 when 20 Cc. of the spirit are employed. From these observations it becomes evident that by employing material of maximum strength, the resultant spirit will be only slightly above the official limit, whilst when material of minimum strength is employed it will be hopelessly below. In cases of deficiency, due to ammonium carbonate, the total alkalinity may be sufficiently raised by the addition of a few Cc. per liter of the strong ammonia solution. But in no case is it necessary to add more ammonium carbonate. Such addition would not alone tend to raise the specific gravity beyond the official limit, but would also increase the amount of carbonic acid in the preparation; for, if the correct weight of the commercial salt is introduced, no deficiency of carbonate will occur in the product, since ammonium bicarbonate produces even slightly more normal carbonates than an equal weight of freshly-sublimed specimens composed of carbonate and acid carbonate.—Pharm. Journ., Feb. 17, 1900, 144–148.

Spiritus Formicarum — Composition and Changes on Keeping.—The original method of preparing spiritus formicarum consisted, as is well known, in directly distilling ants with alcohol. H. Kühl observes that the product obtained in this way contained besides formic acid an essential

oil. In modern Pharmacopœias (so in Ph. G., II.), the use of ants for this preparation is dismissed, and the spirit is now prepared by mixing formic acid, alcohol and water in certain proportions. Under these conditions a certain amount of ester is formed on keeping, as has been shown ten years ago, by Prof. H. Beckurts, and Mr. Kühl has now investigated to what extent these changes may affect the composition of this official preparation of the Pharm. Germ. These investigations have pointed out the remarkable fact that not alone is a portion of the formic acid consumed to form an ester, but that certain processes of change occur, whereby the acid itself is destroyed. Thus, the quantity of acid required for 25 Cc. of the spirit is 0.2235 Gm. This, when titrated from time to time during three months, was gradually reduced from 0.21482 Gm. of free acid to 0.1150 Gm.; while the total amount of formic acid, evidenced after saponification of the ester formed, was reduced from 0.21528 Gm. to 0.17848 Gm. These results show conclusively that there is a constant formation of ester in the official spirit, but that this ester formation is accompanied by certain processes — requiring further investigation — which reduce the amount of acid, but are not as energetic as the formation of the ester.—Apoth. Ztg., July 22, 1899, 477–478.

Lemon Extracts—Commercial Quality.—A. S. Mitchell has examined commercial extracts of lemon supplied by grocers. He found them to contain alcohol in amounts varying from 14 to 94 per cent., and oil of lemon from none to 8 per cent. The extracts low in alcohol had in many cases a fine aroma derived from agitation with new oil of lemon in some cases, but more frequently produced by citral and so-called "soluble oil of lemon," or by lemon-grass or citronella aldehyde, and frequently with the addition of tincture of mace, nutmeg, or capsicum. The cheaper grades contained so little oil in solution that the addition of water frequently failed to produce turbidity. Among the coloring matters found to have been used in preparing the extracts were naphthol-yellow, tropæolin, and dinitrocresol.—Jour. Am. Chem. Soc., 21, 1132.

Toilet Waters—Various Formulas.—The "Zeitschrift für Kosmetik" (1899, 165) gives the following formulas for toilet waters, which appear to be new and will probably be found a useful addition to the pharmacists' formulary of toilet requisites. It should be understood that the proportions are all by weight.

Eau de Bouquet: Oil of Ceylon cinnamon, 2; oil of Neroli (petale), 2; oil of rose, 4; oil of cloves, 16; oil of bergamot, 16; oil of lavender (Mitcham), 16; musk-tincture, 30; alcohol (finest), 95°, 1914 parts.

Eau de Floride: Heliotropin, 2; oil of cloves, 4; oil of neroli (petale), 4; oil of bergamot, 8; musk-tincture, 30; ambra-tincture, 30; esprit de rose triple, 60; ionone-tincture, 150; alcohol (finest), 95°, 1712 parts.

Eau de Grasse: Oil of rosemary, 1; oil of ylang-ylang, 1; among them nium (Spanish), 3; oil of lavender (Mitcham), 3; oil of berga- with that of lemon, 12; oil of orange (sweet), 12; oil of neroli (petale), 12 a table tincture, 16; musk tincture, 16; alcohol (finest), 95 per cent., parts.

Eau de Lavande Dubelle: Oil of rose, 2; oil of lemon, 2; ambr- tincture, 16; musk tincture, 16; oil of lavender (Mitcham), 30; alcohol (finest), 95 per cent., 1980 parts.

Eau de Cologne Royale: Oil of Ceylon cinnamon, 2; oil of rosemary, 2; oil of lavender (Mitcham), 8; oil of neroli (petale), 8; oil of lemon, 8; oil of orange (sweet), 8; oil of bergamot, 8; esprit de rose triple, 120; alcohol (finest), 95 per cent., 1836 parts.

Eau de Lavande Victoria: Oil of rose, 2; oil of lavender (Mitcham), 40; ambra-tincture, 20; eau de cologne, 250; alcohol (finest), 95 per cent.. 1678 parts.—Apoth. Ztg., Nov. 25 and Dec. 2, 1899, 713 and 728.

STYLI.

Aristol Pencils—Formula. — Pufke recommends the following formula for preparing aristol pencils: Aristol, 0.25 Gm.; rice starch, 2 Gm.; sugar, 3 Gm.; glycerin ointment, 0.5 Gm.; mucilage of acacia, 3 drops; water, 8 drops. Make 10 pencils.—Pharm. Centralh., Oct. 26, 1899, 657.

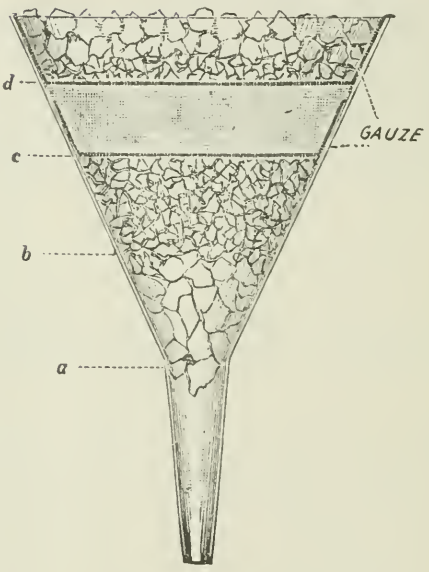
Pencils of Silver or Mercury Salts, Permanganates, etc—Preparation.—Garroud recommends kaolin, freed from organic impurities by calcination or washing with potassium permanganate solution, for preparing pencils of silver nitrate, of mercuric chloride, or of potassium permanganate. From 10 to 15 Gm. of the kaolin are incorporated with finely pulverized salt, and triturated with water to form a mass of ointment consistence, which is rolled out into cylinders of suitable length upon a wood or marble slab. If the mass becomes brittle, it may be restored to plasticity by a few drops of water, and pencils which have become hard may be restored to their original consistence by dipping them for a moment into water. When kept in vials they should be placed upon a layer of moist cotton and covered with dry cotton. In this way the author hss successfully prepared and preserved pencils containing 50 per cent. of the permanganate and 2 to 4 per cent. of corrosive sublimate. The permanganate stains produced on the hands during the process of rolling out may be removed with sodium bisulphite, but when silver nitrate is used as the medicament, the hands should be protected with gloves.—Pharm. Post, Oct. 1, 1899, 535; from Rép. de Pharm.

SUCCI.

Fruit Juices—Practical Method of Filtration.—In the course of a review of numerous methods and suggestions for the preparation of rasp-

oil. In mo[illegible] ave been made during the past year—which this prepa[illegible] oil of gera- ntage — the editor of the "Pharmaceutische formic a[illegible] mot, 6; oil gives a description of a method for the fil- dition [illegible] ambra- 1918 ay find practical application for filtering ten [illegible] 515 clarify by the ordinary methods of filtra- t[illegible] pendent upon the proper preparation of own by the accompanying cut (Fig. 57).

FIG. 57.



Selecting a funnel of suitable capacity, this is filled from *a* to *b* with coarse fragments of glass, and from *b* to *c* with smaller fragments. The surface at *c* is then covered with a piece of gauze, large enough to extend some distance (above *d*) up the sides of the funnel, and a magma of paper pulp is placed upon this up to *d*, then a second disc of gauze, and finally more glass, at first smaller and lastly larger fragments. The larger piece of gauze, extending above the line *d*, the paper pulp may be removed and replaced with greater facility than would otherwise be possible. The filter is first thoroughly washed with water until this passes pure and clear, when after draining, the first juice is poured on and will filter rapidly and clear from the beginning. The review deals also with methods of preservation, restoration, examination and determination of the composition of both raspberry juice and the syrup made from it.

Lemon Juice—Examination of Commercial Samples.—O. Langkopf has

examined a number of commercial samples of lemon juice, among them one designated as "natural-pure," and gives the results, together with that obtained with the juice of ripe lemons expressed by himself, in a table as follows:

	Juice expressed from Ripe Lemons.	Commercial Juice guaranteed "Natural-pure."	Other Commercial Lemon Juices.
Specific gravity	1.0434	1.028	1.03–1.035
Citric acid	8.274 per cent.	7.63 per cent.	6 to 7 per cent.
Alcohol	—	2.16 vol. per cent.	5 to 6 vol. per cent.
Sugar	2.5 per cent.	—	—
Salicylic acid	—	0.1 per cent.	—

The guaranteed "natural-pure" was evidently an exclusively artificial example. In connection with this examination the author calls attention to some difficulties experienced in determining *salicylic acid* (which see under "Organic Chemistry") in the presence of citric acid.—Pharm. Centralh., 1900, 335.

Succus Herbarum—Formula of the Dresden Apothecaries' Society.—Equal parts of fresh milfoil leaves, dandelion leaves, water cresses and chervil are pulped finely, expressed, and the resultant juice is strained.

SUPPOSITORIA.

Suppositories—Cold Process and Moulding.—Thos. W. Murphy points out a satisfactory method of preparing suppositories which combines the cold process of mixing the ingredients and rolling them out by hand with that of molding. The mass is rolled out into cylinders, cut into suitable divisions, each piece is superficially shaped with the fingers, and then introduced into a mould previously dusted with lycopodium. In two or three minutes the mould may be disconnected, when the suppositories will usually drop out readily. Except in hot weather, it is an advantage to add a few drops of fixed oil to the cacao butter. In cold weather, 5 per cent. of petrolatum helps materially to make a mass, and does not render the suppository too soft.—Merck's Rep., Aug. 1899, 350.

Suppositoria Glycerini—Formula of the Dresden Apothecaries' Society.—Cacao butter, 40; spermaceti, 10; glycerin, 25; castor oil, 25; mix and form suppositories weighing 2 Gm. each.

Ichthyol Suppositories—Addition of Tragacanth in Lieu of Wax.—Gust. Selton, referring to the statement of Eschenburg that the addition of wax to the cacao butter is necessary when preparing ichthyol suppositories, observes that the use of wax may be avoided and the suppositories prepared without heat, if from 10 to 15 per cent. of tragacanth be incorporated

with the prescribed quantity of ichthyol, and this mass then triturated with the necessary quantity of cacao butter. The resultant mass, which requires not more than five minutes in its preparation, is plastic and may be readily rolled out and shaped into suppositories or vaginal cones in the usual way.—Apoth. Ztg., Feb. 3, 1900, 84; from Pharm. Post, 1900, 52.

SYRUPI.

Medicinal Syrups—Improvement of Several Official Formulas.—F. W. Haussman makes some criticisms concerning several of the official syrups, and suggests improved formulas for them. For

Syrup of Orange, a less complicated process than the one directed by the U. S. P. is desirable. A formula which directs the syrup to be made from spirit of orange appears to possess desirable qualities, easy and rapid manipulation and a pleasant odor and taste, but is liable to become terebinthinate in odor on standing. A syrup possessing the agreeable properties of orange must be made from the peel subjected to extraction with alcohol in the cold, and it should contain less alcohol than is retained in the syrup now official. The author suggests that 50 Gm. of the freshly grated peel, as free as possible from the white inner layer, be macerated in 100 Cc. of alcohol during 24 hours; the mixture is transferred to a percolator, allowed to drain, and percolated with alcohol, added in small portions, until 100 Cc. of liquid is obtained. This is mixed with 50 Gm. of precipitated calcium phosphate and 150 Gm. of sugar in a mortar by trituration, set aside in a warm place until the greater part of the alcohol has evaporated, then diluted with 300 Cc. of water and filtered clear. The remainder of the sugar—750 Gm.—is then dissolved in the filtrate by agitation without heat, sufficient water added to make 1000 Cc. of product, and this is strained if necessary. If magnesium carbonate is substituted for calcium phosphate, a superior product, more attractive in appearance and of brilliant color is obtained.

Syrup of Wild Cherry Bark, as at present prepared officially, contains too much glycerin. It should be reduced to about one-half, viz., 75 Cc. to 1000 Cc. of finished syrup, and the sugar should be increased from 700 to 750 Gm. The author is convinced, however, that a certain amount of glycerin should be retained, and he thinks that it should be a part of the percolating menstruum. He has found an

Acetous Syrup of Wild Cherry to possess some advantages, chiefly, however, on the ground of its pleasant acidulous taste, and an apparent advantage from a mercantile stand-point. It is made by moistening, macerating for 24 hours and percolating under well known manipulation, 150 Gm. of wild cherry, first with a mixture composed of 100 Cc. of glycerin, 200 Cc. of a mixture, 1 part of diluted acetic acid, 5 parts of water, following this with a mixture of acetic acid and water in the same proportion until 450 Cc. of percolate are obtained, in which 750

Cc. of sugar are dissolved, without heat, by agitation. The syrup is finally strained, sufficient of the acid mixture being passed through the strainer to make 100 Cc.

Syrup of Rose, when prepared extemporaneously by simple admixture of fluid extract and syrup, is satisfactory for ordinary purposes, but is somewhat cloudy. If it has to be kept on hand for some time, a clear bright syrup is obtained, as follows: Mix 125 Cc. of fluid extract of rose with 300 Cc. of water and 10 Cc. of diluted sulphuric acid. After standing two hours, filter, dissolve 750 Gm. of sugar in the filtrate by agitation, without heat; strain, and pass sufficient water through the strainer to make the product measure 1000 Cc. The advantages of adding diluted sulphuric acid are a brighter colored syrup, an agreeable acidulous taste, and possibly an increased astringency—the disadvantage, the liability of the inversion of the sugar.—Amer. Journ. Pharm., Feb., 1900, 69–71 and 73.

In continuation of his studies concerning the official medicinal syrups, Mr Haussman contributes several additional papers in which, after criticism of the existent formulas, he recommends improved formulas, as follows:

Syrupus Hypophosphitum: Calcium hypophosphite, 45 Gm.; potassium hypophosphite, sodium hypophosphite, of each, 15 Gm.; diluted hypophosphorous acid, 10 Gm.; sugar, 700 Gm.; spirit of lemon,* 5 Cc.; water, a sufficient quantity to make 1000 Cc. Triturate the hypophosphites with 350 Cc. of water, allow the undissolved portion to subside, decant the clear liquid, and add the diluted hypophosphorous acid to the residue, triturating until solution is effected. Mix the liquids, add the spirit of lemon, filter, and dissolve the sugar in the filtrate by agitation (or percolation) without heat, adding enough water through the filter to make 1000 Cc.

Syrupus Ferri Iodidi.—For this Mr. Haussman proposes a modification of the formula suggested by A. R. L. Dohme in 1897 (see Proceedings, 1898, 728), in which, however, inadvertently perhaps, the final product was adjusted to 1000 Cc. instead of 1000 Gm., as it should be. The modification consists essentially in a reduction of the amount of sugar from 850 Gm. to 600 Gm., the substitution of 20 Cc. of diluted hypophosphorous acid, U. S. P. (= 10 per cent.) for 5 Cc. of 50 per cent. acid, and the final adjustment to 1000 Gm. With regard to the official

Syrupus Ferri, Quininæ et Strychninæ Phosphatum, the author observes that the difficulties with this preparation are so manifold that under exist-

* If the syrup is kept for some time, it invariably acquires an unpleasant terebinthinate odor and taste. The Pharmacopœia should therefore direct, or at least permit, the addition of spirit of lemon when the syrup is being dispensed; or, perhaps better, change the flavoring ingredient.—Rep.

ing conditions it is impossible to suggest a remedy for the defects in the formula. The difficulty with Easton's syrup is one common to all syrups containing much free acid, due to caramelization of the sugar. Experiments made to avoid the excess of free phosphoric acid prove that the excess of acid is necessary to hold the alkaloidal salts in solution. It is an open question whether a reliable formula for a

Compound Syrup of Hypophosphites Containing Iron, Quinine and Strychnine might not enjoy the confidence of physicians and supply an acceptable substitute for the comparatively obsolete Easton's syrup.

Syrupus Amygdalæ, on account of its liability to decomposition, is best prepared recently, although this is not specified by the Pharmacopœia. The author suggests the following formula, which produces a syrup that does not separate as readily as that made according to the formula now official: Rub 140 Gm. sweet almonds and 40 Gm. bitter almonds, both previously blanched, with 10 Gm. acacia, in granular powder, 100 Gm. of sugar and 50 Cc. water to a smooth paste. Mix this well with 100 Cc. orange water and 100 Cc. water, and strain with strong expression. To the residue add 150 Cc. water, and express again. Mix the strained liquids, in which dissolve 100 Gm. sugar without heat, and add sufficient syrup to make the product measure 1000 Cc.—Amer. Journ. Pharm., May, 1900, 216, 217, 219 and 226.

Official Syrups—Influence of Density.—Prof. Wilbur L. Scoville has made and gives the details of a series of investigations to determine the influence of density on a number of the official syrups, and draws the following deductions from the results obtained: In the case of

Syrup of Iodide of Iron, the main consideration is the protection of the salt from the action of the air by a sufficient proportion of sugar. The present formula of the Pharmacopœia affords a sufficient quantity for the necessities of the case, provided that the hygroscopic nature of sugar is taken into account and allowed for. With most of the medicinal syrups this factor is not important, but with syrup of ferrous iodide it is sufficient to be of consequence. The question whether an additional amount of sugar would be of advantage, as affording a safeguard against variations due to atmospheric moisture, was not satisfactorily determined. A sample of syrup was made in which the water used for preparing the ferrous iodide was also saturated with sugar, but, owing to the presence of a trace of rust in the iron used, the syrup was discolored at the start, and the experiment was therefore of no value. Hydriodic acid, in the strength used in the official

Syrup of Hydriodic Acid, appears to need less protection from atmospheric action. Its own action upon the sugar is of no more importance, and while this may not be hindered greatly by a reduction in the proportion of sugar, it is less noticeable. A reduction of sugar strength of this

preparation is therefore of advantage as yielding a better appearing and better keeping preparation. About three-fifths of the quantity now employed appears to be satisfactory. It is noticeable that the commercial brands of this syrup are lighter in specific gravity and more limpid than the official preparation. On examination several of these failed to reveal the presence of glycerin, except in one instance, where sugar was found to be entirely lacking. The experience of the large manufacturers is undoubtedly in favor of a thin syrup. In the

Syrup of Hypophosphites, the hypophosphites appear to be better protected, and therefore more permant, if a denser syrup than now official is employed. An increase in the quantity of syrup (sugar? Rep.) used by 40 or 50 per cent. yields a better keeping preparation. In

Syrup of Acacia, the quality of the gum employed is the main consideration. The density of the syrup undoubtedly would also have some material influence, as in all syrups which are liable to fermentation. A few experiments carried out on

Syrup of Althæa showed that a slight reduction in the quantity of sugar employed hastened incipient fermentation very considerably. This is doubtless true with other syrups which trouble in fermenting, and with all such a due regard to the density of the syrups employed, and of the finished syrup, will be found of value in preventing or mitigating such changes.

Some pharmacists have found it more satisfactory to use loaf sugar in the place of fine granulated for preparing syrups, claiming more even results. On the other hand, the claim is made that loaf sugar makes a distinctly yellowish syrup, which is objectionable. This was not noticeable in the samples of loaf sugar used in the above experiments. But the form or character of the sugar used appears to be secondary to the amount.—Drugg. Circ., Oct., 1899, 221.

Syrups (and Elixirs)—Rapidity of Inversion of Cane Sugar.—A. H. Woltersdorf and H. G. Richtman have undertaken an extensive series of experiments with the object of determining the rapidity of inversion of cane sugar in some of the official syrups, and incidentally also in some of the elixirs of the National Formulary. A general plan was adopted for carrying out these investigations as uniformly as possible, which, together with the results obtained, is given in detail. From these results they arrive at conclusions which may be briefly stated as follows: (1) In all cases, heat increases the rapidity of inversion, while cold retards the same. (1) Wherever a free acid is present alone, whether it be organic or inorganic, inversion takes place, the inversion being more rapid in the presence of inorganic than in that of organic acids. (3) The presence of a neutral salt retards the inversion by acids somewhat, and this is particularly true of potassium citrate; and the greater the quantity of neutral salt present, the

less is the rate of inversion. (4) Alcohol does not have any effect as a preventive against inversion, nor does (5) Glycerin prevent the inversion of cane sugar.

The author having shown that inversion occurs in almost every syrup and elixir, the question arises: is the presence of the inverted sugar or glucose detrimental or beneficial to the preparation? to which they reply substantially as follows:

1. Chemically it would not affect the preparation, whether the sugar is present as cane sugar or inverted sugar.

2. From the standpoint of using the preparatian as a vehicle, it would be preferable to have the sugar present as cane sugar, as in this form it would have a sweeter taste.

3. As to the physiological action, it is known that all carbohydrates when taken internally are converted into sugar and absorbed as such. If, however, for physiological reasons the presence of glucose should be deemed detrimental, it would seem to be the duty of the pharmacist to have freshly prepared syrups and elixirs whenever possible, and to keep those he has on hand in a cool place. — Pharm. Arch., May and June, 1900, 81–94 and 101–109.

Syrups—Formulas of the Dresden Apothecaries' Society.—Besides a number of medicinal syrups which are simply duplicates of syrups official in the U. S. P., or given in the N. F., the following are given in the Formulary of the D. A. S.:

Syrupus Althææ cum Vino Stibiato, obtained by adding 2 p. antimonial wine to 98 p. marsh-mallow syrup.

Syrupus Castaneæ Vescæ: A mixture of equal parts of white (= simple) syrup and fluid extract of chestnut leaves.

Syrupus Coccionellæ (Kermessirup): Cochineal, in powder, 3, potassium carbonate, 2, cream of tartar, 4, alcohol, 10 parts, are heated with 60 parts of water to boiling, allowed to cool, filtered, and 120 parts of sugar are dissolved in 80 parts of the filtrate.

Syrupus Codeini: Dissolve codeine phosphate, 0.10 Gm., in simple syrup, 100.0 Gm.*

Syrupus Ferri Albuminati: Dried egg albumen, 3 p., are dissolved in water, 17 p., and mixed with syrup, 60 p., and iron saccharate (G. Phar.), 20 parts.

Syrupus Kreosoti: To be prepared from creosote, 10; calcined magnesia, 3.5; syrup, 70; peppermint water, 16.5 parts.

Syrupus Plantaginis: Extract of plantain leaves—prepared by the G. P. process for extract of hyoscyamus—10 parts, are dissolved in 500 parts each of purified honey and simple syrup.

* This syrup is only about *one-tenth* the strength of the syrupus codeini, N. F.—Rep.

Syrupus Scillæ Compositus: Cinnamon, 5 p.; ginger, 5 p.; macerate for 3 days in vinegar of squill, 100 parts. Filter, and dissolve 150 parts of sugar in the filtrate.

Syrupus Valerianæ: 5 parts of valerian root are macerated for 2 days in 5 parts of alcohol and 45 parts of water, expressed, filtered, and 60 parts of sugar are dissolved in 40 parts of the filtrate.

Syrupus Zingiberis is obtained by the addition of 4 parts of a concencentrated tincture of ginger - prepared by percolation with *diluted alcohol* in the proportion of 1 : 2—and 96 parts of simple syrup, and then filtering.—Apoth. Ztg., April 21, 1900, 270.

Syrup of Tolu, B. P.—Improved Process.—E. H. Farr and R. Wright find on experiment that when following the B. P. process for preparing syrup of tolu a considerable loss of volatile matter is occasioned, due to the requirement of boiling the balsam with water. Moreover, the amount of cinnamic acid in the finished preparation is liable to vary considerably, according to the time of the year when it happens to be made, being greater during hot than during cold weather. The fragrant volatile bodies and the cinnamic acid being the essential ingredients, the authors have tried different processes with the view to retain these in their maximum quantity uniformly in the finished product. The U. S. P. process is regarded as complicated, while the product has scarcely more flavor, and is considerably less acid than the B. P. syrup. The following process is recommended: Take 4 of balsam and dissolve in 12 of alcohol 90 per cent., then add to 26 of water, previously heated to 70° C. and placed in a bottle; shake vigorously, then set aside for twenty-four hours; filter bright. Mix the filtrate with 7 times its volume of simple syrup. The flavor of the preparation made by this process is excellent, and it contains a high percentage of acid constituents. If desired, the solution may be kept, and diluted as required. It is liable to deposit crystals in cold weather, but then redissolves readily by placing the bottle in a warm place. —Trans. Brit. Pharm. Conf., 1899, 366–370.

Syrup of Tolu—Return to the Process of the U. S. P., 1870.—A. E. Hiss has not succeeded in obtaining a satisfactory syrup of tolu either by the 1880 or 1890 process, and advises a return to the process of the U. S. P., 1870. This produces a lemon-yellow syrup of fine flavor, which keeps well. If the magnesium carbonate be objected to on account of the slightly alkaline product produced, it may be replaced by calcium phosphate or purified talcum.—Bull. Pharm., Dec., 1899, 498.

Syrupus Ferri Iodidi—Modification of B. P. Assay Process.—F. H. Alcock observes that when following the directions in the assay process of the B. P. for syrup of ferrous iodide it is not possible to precipitate the whole of the iron as ferrous carbonate, because of the presence of the large amounts of sugar, but that proceeding as follows the amount of iron

compound in the filtrate will be reduced to a minimum: Into a graduated 100 Cc. stoppered cylinder 80 Cc. of distilled water are put, and in this the gramme of pure dried sodium carbonate is dissolved, and the volume made up to 90 Cc. with the water; then the syrup is added to the 100 Cc. mark, the whole vigorously shaken and the official quantity, or more if thought desirable, filtered at once through a dry English filter paper, the texture of which appears to be suitably adapted for iron precipitates. By this plan it becomes an easy matter to filter in a very short time as much as 85 Cc. of clear liquid out of the whole quantity of liquid originally present. For the purpose of neutralization very dilute nitric acid should be used, or better still, diluted acetic acid, and the titration conducted in the usual way, using white dishes in place of glass flasks.—Pharm. Journ., Oct. 21, 1899, 378.

Syrupus Ferri Iodati, Pharm. Germ.—Modification of Process of Preparation and Assay.—Dr. B. Grützner finds that when the official (Ph. G.) directions for preparing syrup of ferrous iodide, which require the filtration of the solution into syrup, are followed, it is impossible, under the most careful manipulation, to obtain a product containing more than 4.90 per cent. of ferrous iodide, whereas 5 per cent. is the official demand. The latter percentage may, however, be obtained if the solution of ferrous iodide is added to the simple syrup before filtration, and the syrup is then filtered through a dry filter after careful admixture and subsidence. To insure absolute accuracy an allowance must be made for the excess of powdered iron directed, thus: from 42 Gm. I and 12 Gm. Fe, 1002 Gm. —the 2 Gm. being the excess of iron employed.

The assay of the syrup presents some difficulties when it is endeavored to titrate the iodine in the presence of iron in neutral media, but is readily accomplished if the titration is effected in acid solution. The author recommends the following: 10 Gm. of the syrup, accurately weighed, are diluted with 200 Gm. of water; 5 Cc. of nitric acid and 40 Cc. $\frac{N}{10}$ solution of silver nitrate are added with gentle shaking, followed by 1 Cc. of ferric alum solution (1 : 10) or ferric sulphate solution (1 : 10). On now adding $\frac{N}{10}$ solution of ammonium sulphocyanide, from 7.8 to 7.9 Cc. of this should be required before the liquid above the precipitate acquires a rose tint. The reaction depends on the fact that in the presence of silver nitrate the sulphocyanide does not react with the ferric salt until the silver has been completely precipitated as colorless (white) silver sulphocyanide. The amount designated under the conditions of the test corresponds to the excess of $\frac{N}{10}$ silver nitrate originally added.—Pharm. Ztg., March 17, 1900, 210.

Syrup of Ferrous Arsenate—Formula.—According to "Annal. policlin. de Lille," the specialty known as "Sirup d' arseniate de fer de Clermont" is prepared as follows: Sodium arsenate, 0.34; ferrous sulphate (pure), 0.30; citric acid, 0.80; distilled water, 10.0; syrup, 990.0. The iron

sulphate and citric acid are dissolved in one-half of the water, the sodium arsenate in the other half, the two solutions are mixed and incorporated with the syrup. A teaspoonful represents 1 mg. of ferrous arsenate.—Pharm. Post, Aug. 13, 1899, 4441; from Bull. de Pharm. du Sud-Est.

Syrup of Bromoform—Formula.—Brèbian recommends the following formula for a syrup of bromoform: Bromoform, 5.0; alcohol of 95 per cent., 45.0; glycerin, 150.0; syrup, 800.0. The mixture is effected in the order given and the container placed in warm water until the mixture becomes perfectly clear.—Pharm. Post, July 23, 1899, 407; from Petit Monit. de Phar.

Standard Cough Syrup—Formula.—C. K. Meredith recommends the following formula, for which he claims no originality, for adoption by the North Dakota Pharmaceutical Association, as a standard cough syrup: Wild cherry bark, 1 oz.; white pine bark, 1 oz.; balm of Gilead buds, 1 dr.; blood root, 1 dr.; sassafras bark, 1 dr.; ipecac, ½ dr.; ammon. mur., 1 dr.; chloroform, 1 fl. dr.; alcohol, 2¾ ozs.; water, 5⅓ ozs. (sugar, a sufficient quantity! Rep.). Make the wild cherry bark into syrup as directed in U. S. P. Macerate and percolate the balance, add sugar (quantity omitted in original! Rep.), dissolve, mix the two syrups and add enough water to make 16 ozs.—Proc. North Dakota Pharm. Assoc., 1899, 44.

Fruit Syrups—Determination of Foreign Coloring Matters.—Spaeth has made comprehensive experiments to determine the presence and to distinguish the coloring matters that are and may be added to fruit syrups, particularly in raspberry syrup, which in recent years is more frequently adulterated than formerly. He enumerates many vegetable coloring matters that serve as additions, and divides them into groups in which the individual coloring substances give reactions that, while identifying them as belonging to the particular group, cannot be distinguished from each other. Thus the coloring matters of raspberries, strawberries, currants and cherries form one group; huckleberries, blackberries and elderberries a second; pokeberries and beets a third; and malva flowers a fourth group. Besides these, cochineal, carmine, alkanet, cudbear and madder are used, while the coal-tar colors find frequent application for coloring artificial fruit syrups. Specific directions are given for distinguishing between the different groups of vegetable coloring matters, their important reactions being exhibited in a table accompanying this very useful paper, which is given in abstract in Apoth. Ztg., Nov. 18, 1899, 695–697; from Ztschr. f. Unters. d. Nahr. u. Genussm., 1899, 633.

TABELLÆ.

Tablet Triturates — Increased Popularity. — In reply to a query of a committee of the Penna. Pharm. Assoc., D. J. Thomas has collected some

statistical information concerning the manufacture and use of tablet triturates, and, incidentally, of compressed and coated tablets. He finds that the popularity of tablets, instead of being on the wane, is attested by the increased output and consumption. Five years ago a single operative could make 25,000 tablet triturates daily; with improved apparatus, the daily product per operative is, on an average, 100,000. And so it is with compressed tablets, which with the improved machinery of the present day are produced in many times the quantity per operative that was possible in 1894. But the improvement has not alone been in the apparatus and increased output, but in physical appearance, elegance of finish, ready solubility and disintegration, and the retention of the characteristic color of the drug, all of which has tended to dispel from the minds of physicians opposed to tablets much of the prejudice formerly held against these products. The growing demand for tablets is practically shown in that for the chocolate-coated kind. Many of the bitter medicines, such as quinine, strychnine, aloes, etc., are masked by this coating, which at the same time adds to their appearance and the preservation of the enclosed medicament. In the author's opinion, tablets have come to stay. —Proc. Penna. Pharm. Assoc., 1899, 169–171.

Tablet Triturates—Keeping Qualities.—Chas. Schmidt has made a series of investigations concerning the keeping qualities of tablet triturates covering some of the most important medicinal agents, and as a result of this, coupled with similar observations during an experience of the past six or seven years, has arrived at the following conclusions: First, tablet triturates will not likely keep better, nor should they be expected to keep better than the medicaments which they contain: nor will they, nor can they be expected to keep as well when stored under less favorable conditions. The disadvantage, if any there be, is likely to lie with the tablet triturate. Second, tablet triturates form a class of stable pharmaceutical preparations, keeping well a reasonable length of time and comparing in their keeping qualities quite favorably with most other forms of pharmaceutical preparations, provided certain conditions are complied with, which may here be briefly outlined as follows:

1. Reasonable suitability of the medicament for this form of preparation. 2. Best quality of the medicament. 3. Greatest care in the selection of diluent and excipient on the grounds of suitability and quality. 4. Proper pharmaceutical knowledge and skill. 5. Careful storing in a perfectly dry and cool place in a dry and clean container, protected from light and air.—Proc. Maryland Pharm. Assoc., 1899, 68–73.

Lamellæ Homatropinæ—Improvement of Formula, B. P.—The homatropine discs of the B. P. are required to contain $\frac{1}{100}$ grain of hydrobromide in a total weight of about $\frac{1}{50}$ grain. E. W. Lucas says that experience shows it to be impossible to comply with this requirement, as $\frac{1}{100}$ gr. of colloid basis is insufficient to prevent the salt crystallizing out when

the film dries. Some time ago the author published a working form, but, through a clerical error the quantity of basis for 1000 discs was given as 80 gr. instead of 180 gr. This formula should read—

Gelatin	30 gr.
Glycerin	3 gr.
Distilled water	150 gr.
Homatropine hydrobromide	10 gr.

Dissolve and pour on to a waxed plate, so as to produce a film exactly 4 inches square. When dry, but still supple, punch out discs $\frac{1}{4}$ inch diameter. The product is about 784 discs, the remainder of the film being wasted. Each disc will weigh rather less than $\frac{1}{20}$ gr. It may be remarked that no inconvenience has been found in using discs weighing $\frac{1}{15}$ gr., as, owing to their extreme tenuity, they soften directly they are inserted beneath the eyelid.—Chem. and Drugg., Dec. 9, 1899, 959.

Triturates of Active Medicaments—Convenience for Dispensing.—Prof. A. B. Stevens calls attention to the convenience and accuracy in dispensing of triturates of strychnine, arsenic, and such other substances as are dispensed in fractions of a grain. These should be made in the proportion of 1 of the medicinal substance to 11 of sugar of milk, or 1 part in 12. Then 1 grain of the triturate will contain one-twelfth grain of the drug, two grains one-sixth, three grains one-fourth, four grains one-third, six grains one-half, eight grains two-thirds, nine grains three-fourths. This proportion will be found convenient in dispensing fractional parts of a grain. Should the dispenser receive many prescriptions written in the metric system, it is well to keep on hand a few 10 per cent. triturates. The triturates should be very carefully prepared by mixing the medicinal substance with an equal measure of the sugar of milk, triturating thoroughly. Add the remaining sugar of milk in small portions, triturating thoroughly after each addition. Finally pass the whole through a fine sieve.—Amer. Drugg., Dec. 26, 1899, 354.

TINCTURÆ.

Tinctures by Maceration — Criticism of the Requirements of the B. P., 1898.— Calling attention to the revision of the B. P. of 1898 to the process of maceration in the manipulation of some of the tinctures, Thomas Dunlop observes that although the instructions given in each case are very definite, an occasional inquiry is made whether the finished tincture is to be brought up to a definite volume or not. Of the thirty tinctures made by mixture or maceration, twelve are directed to be made to the volume of one pint. In the other eighteen one pint of menstruum is directed to be taken, and nothing is said about finishing the product, no allowance being made either for increase or diminution of volume. The plea is put forward for not "making up," that what remains in the marc after expres-

sion is of the same strength as what has been expressed, the deduction being that to authorize "making up" would tend to foster careless manipulation. The author thinks, however, that no practical pharmacist would be blind to the fact that the time required for thorough expression is of less value than the tincture that would be lost through slipshod workmanship. He records the results obtained with a number of tinctures, selected as typical, which determined the absolute amount of tincture obtained by thoroughly expressing the marc in an ordinary screw press, and in making a pint quantity. The process thoroughly exhausts the drug, and the marc in such case, after expressing and drying, was inert. Nevertheless, he thinks the process might be improved by macerating the prescribed drug in three-fourths the necessary quantity of menstruum, expressing, and washing out the marc with the remainder of the menstruum and expression.—Pharm. Journ., Dec. 23, 1899, 603.

Tinctures—Formulas of the Dresden Apothecaries' Society.

Tinctura Antasthmatica—"*Asthma Drops.*"—Prepared by mixing equal parts of tincture of opium, tincture of stramonium, and anisated spirit of ammonia.

Tinctura Aurantii Composita—"*Bishop's-Essence.*"—Recent green peel of unripe oranges, 60 Gm.; Curaçao orange peel, 180 Gm.; Malaga (sweet, Rep.) orange peel, 90 Gm.; Ceylon cinnamon, 2 Gm.; cloves, 7.5 Gm.; vanilla, 11.0 Gm.; neroli oil, 4 drops; alcohol, 1500 Gm.; Hungarian wine, 720 Gm.

Tinctura Cascaræ Sagradæ.—Cascara sagrada, in coarse powder, 1; diluted alcohol (Ph. Germ.), 5 parts.

Tinctura Chamomillæ Anglica—"*English Chamomile Drops.*"—Gentian, 16; Roman chamomile flowers, 32; oil of Roman chamomile flowers, 5; alcohol, 180 parts.

Tinctura Cocæ.—Coca leaves, 1; diluted alcohol (Ph. Germ.), 5 parts.

Tinctura Coffeini Composita.—Pecco-flower tea, 10; diluted alcohol (Ph. Germ.), 100; coffeine, 1 part.

Tinctura Condurango.—Condurango, in coarse powder, 1; diluted alcohol (Ph. Germ.), 5 parts.

Tinctura Frangulæ.—Frangula bark, in coarse powder, 1; diluted alcohol (Ph. Germ.), 5 parts.

Tinctura Guaranæ.—Guarana, powdered, 1; diluted alcohol (Ph. Germ.), 5 parts.

Tinctura Guaranæ Composita.—Guarana, powdered, 40; diluted alcohol (Ph. Germ.), 200; coffeine, pure, 1 part.

Tinctura Kolæ: Kola nuts, roasted and powdered, 1; diluted alcohol (Ph. Germ.) 5 parts.

Tinctura Ratanhiæ Borata: Boric acid, 5 Gm.; alcohol, 120 Gm.; tincture of rhatany, 15 Gm.; oil of peppermint, 10 drops.

Tinctura Ratanhiæ cum Salolo and

Tinctura Ratanhiæ Salicylata are made like the preceding tincture, substituting 5 Gm. of salol or 5 Gm. of salicylic acid, respectively, for the boric acid.

Tinctura Rusci Composita: Birch tar, 20; alcohol, 30; ether, 30; oil of lavender, 1; oil of rosemary, 1; oil of rue, 1 part. Allow to stand in a cool place several days and filter.

Tinctura Sacchari Tosti: Commercial caramel, 2; alcohol, 1; water, 1 part.—Apoth. Ztg., April 21 and 25, 1900, 270 and 277.

Tincture of Bitter Orange Peel, B. P.—Comparative Experiments with Different Sorts of Peel.—After briefly reviewing the history of bitter or sour oranges in connection with the London markets and the British Pharmacopœias, H. H. Robins records the results of experiments undertaken to determine the relative value of the peels of the different sorts at present reaching the English market. "Sour" oranges are chiefly imported from Malaga, Seville and Messina, and arrive in this order during the season. The ripe fruit was one of the additions of the B. P., 1874, under the name of "bitter orange," and from this a tincture of the fresh peel was then ordered for the first time. The present B. P. simply mentions the peel of bitter oranges, that from fully matured fruit being evidently intended. The author finds that the bitter properties of the peel are fully developed in the unripe fruit, and that preparations made from the peel of the latter are fully as useful for tonics as those made from the ripe, but they are not so pleasant. Tinctures were made from the rinds of the different fruits mentioned, when it was found that the tincture made from the Messina fruit had the finest aroma, and that when diluted with 500 times its bulk of water it still possessed an orange odor, which was not perceptible in the tincture from the Malaga or Seville fruits under the same conditions. There was apparently no difference, however, in their relative bitterness.—Pharm. Journ., Nov. 25, 1899, 495.

Tincture of Cinchona — Preparation of Definite Strength. — J. Sarthou has prepared tincture of cinchona by various methods, and concludes that alcohol of 60° is the most efficient solvent, and that percolation should be avoided, since by its applications the tincture becomes loaded with considerable quantities of tannin, resin, coloring matter and starch. The proportions of alcohol and bark should be such that the product shall contain 1 per cent. of total alkaloid, and *cold* alcohol should be employed for the extraction. The bark must be assayed for this purpose, and the calculated quantity of alcohol added. The method of assay recommended is briefly as follows: 20 Gm. of the bark (Loxa or Huanoco) are triturated with 10 Gm. of lime and a little water, dried, completely extracted with chloroform, the chloroform distilled off, the residue extracted with hot water containing 20 Cc. of 10 per cent. hydrochloric acid, and the solu-

tion filtered. The filtrate is now mixed with 20 Cc. of 10 per cent. potassium hydrate solution, shaken out with repeated portions of 20 Cc. each of chloroform, the united chloroform solutions are distilled, and the residue dried to constant weight. — Apoth. Ztg., Dec. 9, 1899, 741, from L'Union Pharm.

Fat-Free Tincture of Digitalis—Preparation and Pharmacological Advantages.—Believing that the gastric disturbances, amounting even to nausea and vomiting, sometimes produced when tincture of digitalis is given, may be due in part, if not wholly, to the fixed oil of the leaf and its free acids, Joseph W. England has prepared a fat free tincture, and now records the results of the extensive pharmacological experiments that have been made with this preparation at the Philadelphia Hospital. The fat-free tincture of digitalis is made by exhausting the leaves, freshly-ground to a No. 60 powder, with purified petroleum benzin, either by maceration, or by maceration and percolation, as may be most convenient. The residue is then dried to remove all odor of benzin, the best results being obtained by exposure to the sunlight as well as air. The tincture is then made by the official process from 150 grammes (original weight of the powder), with this difference that only 980 Cc. of percolate instead of 1000 Cc. are obtained. Ammonia water is then carefully added to neutralization, for which from 10 to 15 Cc. are required, and the final measure is made up with diluted alcohol to 1000 Cc. The product is a deep reddish-brown, almost black liquid, of a not unpleasant odor and pure bitter taste, free from the acidity of the official tincture, It does not become turbid on dilution with water, and keeps perfectly for years. On the testimony of Dr. Daniel E. Hughes, the chief resident physician of the Philadelphia Hospital, this fat-free tincture is not alone free from the nauseating properties of the official tincture of digitalis, but its non-irritating properties are forcibly shown upon its hypodermic use, abscesses having never followed its use. The clinical observations in fifteen cases, which are recorded in detail and tabulated in form of a summary by Mr. England, show the fat-free tincture also to be more efficient and prompt in its action. The primary effects of the fat-free tincture were manifested in 15 minutes, and the maximum in 45 minutes: while, with the official tincture, primary effects were evidenced in 30 minutes, and the maximum in 60 minutes. In both cases, however, the *duration* of effect was the same, viz., 30 minutes. No especial difference in the time of absorption between *hypodermic* injections and *mouth-administration* was observable, but when the tincture was given hypodermically the pulse reduction seems to have been greater with the fat-free tincture, though not extending over any greater length of time.—Proc. Penna. Pharm. Assoc., 1899, 158–168; Amer. Jour. Pharm., July 1899, 332–344.

Tincture of Nux Vomica—Direct Preparation from the Drug Preferable to the Official Method. — Lewis Emanuel since preparing tincture of

nux vomica by the present official process from the extract, has had frequent complaints from physicians who had found it less efficient in their practice than the preparation made direct from the drug. Returning to the older method, and adjusting the final product to a strength of 0.3 Gm. of alkaloid in 100 Cc., the preparation gave perfect satisfaction.—Amer. Drugg., Jan. 10, 1899, 3.

Tincture of Nux Vomica — Presence of Copper. — J. Rutherford Hill, having observed the gradual development of a greenish-blue color in a slightly yellowish-white mixture composed of tinct. nucis vom., ʒii., sp. ammon. arom., ʒiv., sp. chloroformi, ʒii., aq. menth. pip., ad. ʒiv., traced the cause to the presence of copper. This was at first thought to be introduced by copper utensils and in the preparation of the tincture, but careful experiments subsequently made point out that nux vomica (which see under "Materia Medica"), contains copper as a natural constituent. The slow development of the blue copper tint is possibly due to the fact that the metal does not occur in the seeds as an ordinary copper salt, but as a complex organic compound, probably of an albuminoid nature. Incidentally, the author mentions that no two of eight samples of tincture of nux vomica examined were alike in color, which ranged from a light brownish-green to a deep, dark brown. — Pharm. Journ., April 21, 1900, 417–418.

Tincture of Strophanthus—Removal of Fat.—Having some years ago noticed that when the percolate obtained in the process of making extract of nux vomica is thoroughly chilled for several hours, the fatty matter in it is separated in a solid condition, and easily removed by filtration, A. C. Loewe and Wilbur L. Scoville concluded to try the same expedient for removing the fat from the official tincture of strophanthus, which, though prepared with a weaker alcohol than that originally (1880) prescribed for extracting the seeds which had previously been deprived of fat by ether, still carries with it a portion of fatty matter in the slow process of percolation to which the drug is directly subjected according to the Pharmacopœia of 1890. The authors describe a number of experiments made with the view to expediting the process of removing the fat, but find none more successful than that of chilling the tincture for two hours to —14° C., and filtering as nearly as possible in that low temperature. The resultant tincture is free from fat and remains permanently clear.—Pharm. Review, Nov. 1899, 496–500.

Tincture of Myrrh, B. P.—Superiority of Percolation over Official Maceration.—George F. Merson observes that, inasmuch as in the present B. P. percolation as a means of exhausting drugs is much more largely employed than in the previous one, it is of interest to inquire whether any special reason exists why tincture of myrrh, which was made by maceration and percolation according to the 1885 edition, should, so to speak, take a

backward step, and resort to maceration only. He has accordingly made comparative experiments by preparing six quarter-pint lots of tincture from, respectively, 20, 30 and 40 powder, using maceration in one set and percolation in the other, with results that clearly indicate the superiority of the process of percolation. After treatment of the No. 20 powder, 8.2 per cent. of resin remained undissolved by the process of maceration, and only 3.4 per cent. by that of percolation. The residues in the other cases were, in the case of No. 30 powder, 3.7 per cent. after maceration, 1.5 per cent. after percolation, and in that of the No. 40 powder, 1.3 per cent. after maceration and 0.0 per cent. (= complete solution of resin) after percolation. The only drawback to using No. 40 powder is the difficulty experienced in getting the myrrh to pass so fine a sieve owing to its oily nature. Then, also, it is too moist and cohesive when freshly powdered to be introduced uniformly into a percolator. If, however, the powder be allowed to stand over night in a closed vessel after sifting, it will cake somewhat, and can be re-sifted in a free condition, in which it may with proper care be packed and percolated without danger of packing too hard or irregularly.—Pharm. Journ., Jan. 20, 1890, 44.

Tincture of Opium — Analyses of Commercial Samples.—John Barclay, in view of the uncertainty as to the alkaloidal strength of tincture of opium as supplied in the (London?) market, subjected samples from seven wholesale houses to analysis with results as follows:

	Sp. gr.	Extractive.	Alcohol by vol.	Morphine.	Comparative Color.
No. 1	0.986	3.10	20.71	0.681	17
No. 2	0.985	3.22	21.19	0.778	14
No. 3	0.989	4.28	21.19	0.700	17
No. 4	0.998	5.09	17.17	0.967	19
No. 5	0.968	3.48	38.04	0.781	20.5
No. 6	0.983	2.54	22.18	0.381	19
No. 7	0.976	4.24	32.98	0.739	23

Extractive, alcohol and morphine are given in parts per cent. by volume. It will be seen that the majority of the samples approximated to the morphine strength of the B. P. tincture of opium (0.75 per cent.), and this percentage should be the recognized standard for the tincture. A mixture of 3 parts of water with 1 part of 90 per cent. alcohol appears to be the menstruum most commonly used.—Chem. and Drugg., Dec. 23, 1899, 1030.

Tincture of Kino—Cause of Gelatinization.—Some observations made by J. Rutherford Hill with tincture of kino made by the B. P. process of 1885, in which glycerin was introduced into the formula, lead him to suggest that the glycerin is of no practical value except in so far as it may

lubricate the stopper of the container and thus prevent evaporation. Two identical samples, the one having gelatinized in an imperfectly stoppered bottle, the other having remained in good, non-gelatinous condition in a securely stoppered bottle, lead him to believe that the gelatinization of kino is not due to any difference in the kino, but rather to the evaporation of the menstruum. If this surmise should prove to be well founded, the true remedy for gelatinization would be a slight reduction in the strength of the tincture—say 1¾ instead of 2 ozs. in each pint, and in keeping the tincture carefully stoppered.—Pharm. Journ., April 21, 1900, 417.

Tinctura Rhei Comp., B. P.—Improved Process and Formula.—E. W. Lucas finds that the B. P. compound tincture of rhubarb is more conveniently prepared by the maceration process. The following formula yields a clear tincture of slightly higher density than that prepared by the official process:

Rhubarb-root, whole	2 oz.
Cardamom seeds, bruised	¼ oz.
Coriander fruits, bruised	¼ oz.
Glycerin	2 fl. oz.
Alcohol (90 per cent.)	12 fl. oz.
Distilled water	6 fl. oz.

Soak the rhubarb in the water for twenty-four hours, bruise in a stone mortar, and add to the cardamoms and coriander in the strong alcohol. Macerate seven days, press, and add the glycerin.—Chem. & Drugg., Dec. 9, 1899, 959.

Tr. Chloroformi et Morphinæ Co., B. P., 1898 — Examination.—The examination of the compound tincture of chloroform and morphine of the B. P. presents difficulties both on account of its complexity and the nature of the ingredients. J. H. Coste, having recently had occasion to examine samples of this tincture, experimented in various directions, and finally devised a scheme which, in his opinion, will be found tolerably satisfactory, but must be referred to in the original paper in Chem. & Drugg., Dec. 30, 1899, 1054.

Tincture of Iron Citro-Chloride—Extemporaneous Formula.—Thos. W. Murphy observes that if a supply of sodium citrate is not in stock, it may be supplied extemporaneously by adopting the following formula: Dissolve 300 Gm. of citric acid in 250 Cc. of water, heat to the boiling point, and neutralize with sodium carbonate, of which, if both are free from efflorescence, about 550 Gm. will be required. To the solution so obtained add 250 Cc. of solution of ferric chloride, mix, and add enough alcohol to make the product measure 1000 Cc. After standing a few days, it may be filtered, if necessary.—Merck's Rep., Aug. 1899, 349.

Tincture of Iodine—Necessity for Stricter Standardization—Prof. L. E. Sayre points out some of the changes which tincture of iodine undergoes

on keeping, and suggests that if the present formula for the tincture be retained in the U. S. P., and if it can be shown that there is a physiologically important difference between the fresh and the old alcoholic solution, it would seem that it would be more desirable to have a test added to the present one of the Pharmacopœia in standardizing the preparation. The present test confines itself simply to the estimation of the free iodine.—Drugg. Circ., March 1900, 46.

Decolorized Tincture of Iodine—Improved Formula.—In a former paper (Notes and New Remedies, Dec. 1897), Ferdinand A. Sieker gave a simple formula for preparing decolorized tincture of iodine, which is based on an analysis of the product obtained when it is prepared by the formula of the National Formulary. This simplified preparation, which the author prefers to, call

Tincture of Iodides, is obtained by dissolving 48.9 Gm. sodium iodide and 47.3 Gm. ammonium iodide in 155.0 Cc. of water, adding 10.0 Cc. ammonia water (10 per cent.), and then sufficient alcohol to make 1000 Cc. He now suggests that distilled water be used, and that the alcohol be of assured purity. Ordinary alcohol generally contains matter which causes it to assume a yellowish color. This foreign matter, being derived from barrels, it may be removed by re-distillation; but a simpler method for this purpose is to shake 1000 Cc. of the alcohol with 0.5 to 1.0 Gm., or a sufficient quantity of potassium permanganate in coarse powder, until the alcohol acquires a dark purple color; then strain from the excess of permanganate, allow the alcohol to stand for a few hours, and filter. The filtrate should be perfectly colorless, and will produce a colorless tincture, which keeps well in glass-stoppered bottles.—Pharm. Review, July, 1899, 306.

TROCHISCI.

Lozenges of the B. P. 1898—Satisfactory Formulas.—In 1891, F. Davis had reported on the unsatisfactory character of the B. P. lozenges of commerce (see Proceedings, 1892, 517), and investigations since made proved similarly unsatisfactory until the advent of the B. P., 1898. Since then, he notes a satisfactory improvement in the commercial quality, which is doubtless due to the definite statement in the current B. P. that each lozenge shall contain a definite weight of active ingredient, and that this definite weight shall be intermingled with a basis of specific composition. —Trans. Brit. Phar. Conf., 1899, 464.

Trochisci Acidi Carbolici, B. P— Objection to the Tolu Base. — E. W. Lucas finds the tolu base directed in the B. P. formula for carbolic acid troches to be apparently unsuitable, black spots frequently appearing after short keeping. When made with the same base, but without tolu, they undergo no change.—Chem. and Drugg., Dec. 9, 1899, 959.

Troches (Pastilli)—Formulas of the Dresden Apothecaries' Society.—

Unless otherwise directed, pastilles are to be prepared with medium finely powdered sugar mixed with 12 per cent. of tragacanth. Each pastille shall weigh 1 Gm.

Pastilli Ammonii Chorati c. Succo Liquiritiæ.—Sal ammoniac, 8 Gm.; extract of licorice, 24 Gm.; medium fine powdered sugar, 68 Gm.; oil of anise, oil of fennel, of each 2 drops. Divide into 100 pastilles.

Pastilli Extracti Opii, "Walther." Extract of opium, 0.6 Gm.; balsam of tolu, 0.8 Gm.; medium fine powdered sugar, 100 Gm. Make 100 pastilles.

Pastilli Pectorales, "Küttner"—Cough Pastilles.—Finely cut ipecac, 1.5 Gm. Infuse for 2 hours in hot water on a steam-bath, strain, evaporate the infusion to dryness, and reduce the residual extract to a fine powder, to which add: morphine hydrochloride, 0.5 Gm.; medium fine powdered sugar, 100.0 Gm., andmake 100 pastilles.

Pastilli Purgans, "Ph. Sax." Calomel, 5.0 Gm.; powd. jalap, 10.0 Gm.; powd. hartshorn, 3.0 Gm.; powd. scammony resin, 2.0 Gm.; powd. cinnamon, 2.0 Gm.; medium fine powdered sugar, 78.0 Gm.; oil of cinnamon, 5 drops. Make 100 pastilles.—Apoth. Ztg., April 11, 1900, 242.

Jujubes—Composition and Preparation.—The throat pastilles so long popular in England and Europe under the name of jujubes have lately gained favor on this side of the water. R. D. Judd has examined eight different sorts, and finds the base to consist of gum, sugar and water in variable proportions, the medicament being morphine, codeine, menthol, thymol, or some acid—the larger number containing morphine. He succeeded in preparing a confection resembling these jujubes by dissolving 18 Gm. of acacia and 6 Gm. of sugar in 80 Cc. of water, straining the solution and evaporating it to 30 Gm. on a water-bath. The thick mucilage so produced holds air persistently, and when poured into moulds sets slowly. It should therefore be allowed to stand until clear after the medicinal agent has been added before pouring into moulds. Two or three days are required for the mass to harden well.—Proc. Mass. State Pharm. Assoc., 1899, 55.

VINA.

Detannated Wine, B. P. C.—Modification of Formula and Precautions.—The detannated wine of the B. P. C. Formulary directs maceration during 14 days of ½ oz. of gelatin, cut small, in one gallon of sherry or orange wine. F. C. J. Bird observes that if the powdered gelatin now obtainable in commerce is substituted for the ordinary gelatin, the detannation can be effected in from 8 to 24 hours, according to the frequency with which the mixture is shaken. In either case, however, care must be taken to keep the temperature at or below 15.5° C., else, during hot weather particularly, the gelatin will pass into solution.—Trans. Brit. Pharm. Conf., 1899, 363.

Cinchona Wines—Approved Formulas.—Georg Weindel (in Pharmaceutische Zeitung) gives an excellent review of the different formulas for cinchona wine employed on the continent of Europe, and communicates in this connection some valuable galenical hints and improvements, whereby the preparations acquire greater stability as well as palatibility. The first formula considered is that of Kremel, in which the disposition of the wine to become cloudy is overcome by a rather circumstantial process. In the following modification the tediousness of the process is avoided to a great extent:

Cinchona in coarse powder	500 grammes.
Slaked lime	60 grammes.
Water	150 grammes.

Mix and allow to stand for about an hour; then add—

Ether	1000 grammes.

Macerate for twelve hours, shaking occasionally; filter the ether, and wash the marc with a little spirit. Then macerate in the following menstruum:

Spirit	70 grammes.
Water	300 grammes.

Three days later add—

Wine	9000 grammes.

Macerate for a fortnight, shaking occasionally. Meanwhile the ether is distilled from the first macerate, and the extract obtained is dissolved in the filtrate from the second maceration, and 275 grammes of citric acid is added, and the wine put aside for a time, and again filtered. If it is desired to have a sweet wine, 10 grammes citric acid and 1500 to 2500 grammes of golden syrup are added.

The product in both cases is faultless as regards taste. Samos, Hungarian, Malaga, and port wines are specially suitable for making it, but the author prefers a mixture of Malaga, 2 parts, and sherry, 3 parts. Only wines of high alcoholic strength should be used. The wine cotains 2.3 to 3 per cent. alkaloids, according to the bark used.

The author then refers to Laroche's formula, which gives a poor product, and adds the following recipe, which he obtained from the late apothecary Pielet, who got it in Lyons. It is greatly used in France:

Coarsely powdered cinchona	500 grammes.
Pure hydrochloric acid	30 grammes.
Glycerin	250 grammes.
Diluted alcohol	500 grammes.

Put into a covered enameled basin, and digest twenty-four hours on a steam-bath; then add—

Sherry wine	10 liters.
Molasses	500 grammes.
Alcohol	250 grammes.

Macerate for five weeks, with occasional shaking. Then press and filter.

Wine prepared in this way tastes strongly of cinchona, but has this drawback—that it cannot be retained by many people, particularly women and children. This, the author is told by physicians, is caused by the glycerin in the wine.

The following formula is an improved modification of one which was published in the *Pharmaceutische Zeitung:*

Fluid extract of cinchona	75 grammes.
Citric acid	2 grammes.
Molasses	100 grammes.
Cognac	40 grammes.
Rectified spirit	100 grammes.
Malaga wine	700 grammes.

This is left to settle for some time, and filtered.

The active ingredients of the bark are retained in this wine, and it has a pleasant taste of cinchona. If one takes the trouble to compare these formulæ with one another, one comes to the conclusion that a common principle lies at the root of them. Citric acid and tartaric acid are used in some cases, and hydrochloric acid in others, to prevent loss of alkaloids. After many trials the author worked out the following recipes:

Cinchona in coarse powder	500 grammes.
Pure hydrochloric acid	30 grammes.
Water	750 grammes.

Digest for twenty-four hours in a covered vessel on a steam-bath; then put into a wide-mouthed bottle with 1,000 grammes of spirit. Set aside for a week, then add

Sherry wine	10,000 grammes.
Molasses	1,500 grammes.
Orange syrup	200 grammes.
Citric acid	10 grammes.

Macerate four weeks, press, and filter.

A very good wine is obtained if, instead of sherry, 10,000 grammes, equal parts of sherry and Malaga, are used. An excellent wine is also obtained by percolation in the following manner:

500 grammes of coarsely powdered cinchona is treated on a steam-bath, as in the last recipe, with a mixture of

Hydrochloric acid	30 grammes.
Water	600 grammes.
Rectified spirit	400 grammes.

The mass is then pressed into a percolator, and 500 grammes of rectified spirit added. Macerate for about six days, then percolate slowly with 5,000 grammes of sherry wine, to which a solution of 15 grammes of citric acid has been added. Continue percolation with a mixture of Malaga wine, 5,000 grammes; molasses, 1,500 grammes; tincture of orange, 50 grammes; and cognac, 500 grammes. Leave for fourteen days to settle, then filter.

Cinchona wine prepared according to these two prescriptions is as clear as gold, and will retain this quality if it is carefully kept—*i. e.*, protected from the light in a brown bottle. Cinchona wine should be kept in a cool cellar for about three weeks before final filtration. For the last few years the author has only used these two last recipes, and has always obtained faultless preparations. He specially recommends the last recipe, with sherry and Malaga wines, equal parts. The wine is then of a dark reddish brown color and of faultless taste, and is specially favored by doctors and patients.—Chem. & Drugg., July 29, 1899, 186.

Vinum Cascaræ Sagradæ—Formula of the Dresden Apothecaries' Society.—Bitterless fluid extract of cascara sagrada, 30 parts, are mixed with 65 parts of Malaga wine and 5 parts of compound tincture of orange (see under "Tincturæ").

Vinum Diureticum, according to the same authority, is prepared by macerating for four days, squill, 3, digitalis, 6, juniper berries, 30, potassium acetate, 9 parts, in alcohol, 50 parts, and white wine, 400 parts, expressing, allowing sediment to subside, and filtering.— Apoth. Ztg., April 25, 1900, 278.

Vinum Muira-puama — Preparation. — Cæsar and Loretz give the following formula for preparing a wine from the Brazilian drug, muira-puama: 100 p. of the coarsely powdered drug are macerated in a mixture of 25 p. alcohol (90 per cent.), 25 p. distilled water, and 950 p. sherry wine, for 10 days, strained, expressed and filtered. The dose is 20 to 30 Gm., twice or thrice daily; but the fluid extract (which see) appears to be the better form for administering the drug.—Pharm. Ztg., Oct. 25, 1899, 762.

MISCELLANEOUS PREPARATIONS.

Headache Preparations—Ingredients in Thirty-six Different Kinds.—Geo. A. Wilson has subjected thirty-six different kinds of headache preparations supplied by Boston dealers to qualitative analysis. He ascertained the presence of acetanilid in 30 samples, sodium bicarbonate in 19, caffeine in 14, phenacetin in 5, tartaric acid in 4, potassium bromide in 3, camphor in 3, monobromated camphor in 2, sodium salicylate in 2 samples, while antipyrine, sulfonal, ammonium carbonate, ammonium bromide, salicylic acid, and potassium and sodium tartrate were present in single samples respectively. In addition, some contained sugar, milk sugar, celery, charcoal, calcium carbonate and sanguinaria, while two samples evidently contained belladonna and gelsemium.—Proc. Mass. State Pharm. Assoc. 1899, 57.

Veterinary Blisters—Various Useful Formulas.—W. A. Dawson observse that the majority of "horse recipes" are wonderful and awesome things, originating heaven only knows where. For a good, dependable blister there is nothing better than the U. S. P. cantharides cerate when properly made from reliable material. The following also answer a useful purpose in special cases:

Red Blister: Two drachms of mercury biniodide, with lard or petrolatum enough to make an ounce, is about right for a quick-acting blister. A

Mild Liquid Blister that will vesicate strongly and not destroy the hair, is obtained by adding 1 ounce of corrosive sublimate to a pint of oil of turpentine. This is to be well shaken and applied with a brush. A

Sure Blister, used on one of the largest stock farms on Long Island, consists of powdered cantharides, 2 ozs.; mercuric biniodide, 2 ozs.; benzoated lard, 12 ozs. A

Sprain Blister is made according to the following formula, though the author knows nothing regarding its efficacy: Euphorbium, 4 ozs.; cantharides, 1 oz.; corrosive sublimate, 4 ozs.; red precipitate, 4 ozs.; iodine, 4 ozs.; white turpentine, 6 ozs.; lard, 6 ozs.—Amer. Drugg., Nov. 10, 1899, 259.

Mange-Cure—Efficient Formula.—W. A. Dawson recommends the following formula for a mange-cure, which is in use at the kennels of the Westminister Kennel Club: Whale oil—genuine — 1 pint: flowers of sulphur, 1 oz.; oil of tar, 2 ozs.; crude petroleum, 1 oz. Shake well and rub in thoroughly once a day. The whale oil must be the real thing, not the common "fish oil" usually supplied by dealers under that name.—Amer. Drugg., Nov. 10, 1899, 259.

Water-Kefir—Preparation.—Cactaret prepares a water-kefir as follows: To water containing 25 Gm. of rock candy in the liter, some kefir grains are added, and the mixture is allowed to ferment in an open vessel for two days. The liquid is then drawn off into strong bottles, which are corked and tied over. After two days the beverage is ready for use. It has the appearance and taste of cider.—Pharm. Ztg., Nov. 4, 1899, 790.

Depilatorium Siccum—Formula of the Dresden Apothecaries' Society.—Barium sulphide, 10 p.; zinc oxide, 5 p.; wheat starch, 5 p. Triturate intimately to a fine powder. To be used as depilatory by making a thick magma, which is allowed to remain on the surface, to which it is applied for 10 minutes.—Apoth. Ztg., April 4, 1900, 225.

Bengal Lights—Practical Observations Concerning their Preparation.—O. Schaefer makes some practical remarks upon the preparation of bengal fires, covering points which are not usually touched upon in works upon the subject. In preparing torches, the cylinder is first filled to the height of 1 to 1½ times its calibre with white bole, then a few grains of gun

powder (about 0.1 Gm.) are put upon the bole, followed by the desired fire mixture in the usual way. The advantage of this consists in the instantaneous extinction of the flame, due to the explosion of the gunpowder when this is reached, the bengal fire burning steadily, if of proper composition, until it is almost completely consumed. The

Red Fire he finds is best prepared by the formula of Websky, which is as follows: Strontium nitrate, dried, 25; potassium chlorate, purified, 15; washed sulphur, 13; antimony sulphide, 4; mastic, 1. If it should burn too rapidly, this may be corrected by adding a little more of the strontium salt.

Green Lights, not less than 9 Mm. in diameter, are best prepared with the following mixture: Barium chlorate, 24; stearin, 3; sugar of milk, 1. The same precautions must be observed with barium chlorate as with potassium chlorate.

When, in the case of wet weather, shellac is added to these colored fires, an addition of 2 to 5 per cent. of potassium chlorate is made when the strontium salt is used, while, when barium nitrate is used, an addition of 3 to 5 per cent. of barium chlorate is made to facilitate combustion and to intensify the color of the flame. In either case, the admixture should be effected by shaking in a suitable vessel, or by stirring with the hands, a piece of cardboard, a wooden spoon, etc.—Pharm. Ztg., Aug. 13, 1899, 584.

Ink—A Good Formula for Pharmacists.—Prof. Wilbur L. Scoville reports the following formula for ink to give the best satisfaction after a trial of some twenty-five different ink-formulas, including the Massachusetts standard formula, by J. A. S. Woodrow, who tested them at the prescription counter during a period covering nearly two years: Dissolve 80 grains of tannic acid, 14 grains of gallic acid and 1 grain of salicylic acid in 8 fluid ounces of water; then 102 grains of ferrous sulphate (granulated) and 90 grains of indigotin, each separately, in 4 fluid ounces of water; then mix the solutions. An almost fadeless, green-black ink is produced, changing to jet-black on standing. It has kept well during the period covering the experiment. If about one-half ounce of sugar is added it is of service as a copying ink.—Proc. Mass. State Pharm. Assoc., 1889, 52.

Ink for Glass—Formula.—The following formula is said to produce an ink which may be used for directly writing on glass: Dissolve 20 parts of resin in 150 parts of alcohol and add to this solution, drop by drop, and under continuous stirring, a solution of 35 parts of borax in 250 parts of water. Finally dissolve 1 part of methylene-blue in the mixture.—Apoth. Ztg., Jan. 6, 1900, 15.

Red Indelible Inks—Practical Formulas.—A good red indelible ink is obtained, according to the "Hannoversche Gewerbeblatt," by means of the following three solutions:

1. Sodium carbonate, 3; gum acacia, 3; water, 12.
2. Platinum chloride, 1; distilled water, 24.
3. Zinc chloride, 1; distilled water, 4.

The article is first moistened with *solution 1*, and rubbed (dry! Rep.) with a warm iron; the characters are then written with a pen dipped in *solution 2;* when the writing is dry it is moistened with *solution 3*.

For linen, the following is useful: White of egg is mixed with an equal volume of water and stirred until it froths; it is then strained through a cloth, and made into a thick paste with cochineal red. With this the characters are then marked on the linen by means of a quill or drawing-pen, and then the spot is ironed on the reverse side with a flat iron until the albumin has coagulated.—Scient. Amer., 81, 23.

Sympathetic Ink—New Material.—According to the experience of Swift a weak solution of phenolphthalein in diluted alcohol affords an excellent material for practically invisible writing which becomes visible when the paper is moistened by carefully applying moisture by means of cotton saturated with a weak aqueous alkaline solution. Care must be taken not to rub the surface since on drying the phenolphthalein simply dries on the surface of the paper and does not penetrate. It is not permanent, however, being destroyed by acid vapor and even by the carbonic acid of the air after prolonged exposure.—Pharm. Post, Oct. 8, 1899, 547.

A. Gawalowski, referring to the preceding, remarks that the use of phenolphthalein for the purposes of an invisible ink is of no practical value on account of the fugitive character of the writing produced with it. A far more useful substance for actual secret correspondence is lead acetate, the invisible character produced upon paper with a solution of it becoming distinct on exposing it to the vapor of hydrogen sulphide produced from a fragment of potassium sulphide and a little vinegar placed in a cup; and, although the characters so produced may fade—owing to oxidation to lead sulphate—they may be reproduced on exposing them to hydrogen sulphide in the same way. The author, incidentally, also finds that the same method may be employed on "blue prints," if these are coated with a colorless solution prepared by adding to a 4 per cent. soda, or 5–6 per cent. potassa, solution a few drops of baryta water, and thickening this solution with a little gum arabic.—Pharm. Post, Oct. 29, 1899, 597.

Catheter Lubricants—Formula.—Kraus recommends the use of a paste of the following composition for lubricating catheters: Tragacanth, 2.5; glycerin, 10; phenol water (3 per cent.), 90. This paste facilitates the passage of the catheter, and is easily washed off in warm water.—(Est. Ztsch. f. Pharm., *53*, 451.

Sealing-Wax—A Preparation Insoluble in Alcohol.—The following formula for a sealing-wax for bottles, etc., containing alcoholic liquids is given in "Pharm. Centralhalle" (1899, 245): Carnauba wax, hard paraffin, each

1 part, are melted together, and, with constant stirring and heating, a mixture of 5 parts of red lead and 2 parts of whiting is thoroughly incorporated.

Universal Cement—Formula.—The "Petit Mon. Pharm." (*49*, 3315) recommends a cement, made by mixing glass, in the finest powder, with white of egg to the desired consistence. Glass, marble, porcelain, crystal, etc., joined with this cement, set so hard that they may not be broken again in the joint so cemented.

Cement for Alcohol Bottles—Formula.—Camerano uses a cement prepared inexpensively by the following simple formula for sealing jars containing specimens in alcohol in the Zoölogical Museum at Turin: Caoutchouc (in the form of old rubber tubing may be used), 200; suet, 125. Melt these together and stir in French chalk, 200. The mixture will keep indefinitely, and is applied, after warming, by means of a glass rod or splint of wood.—Pharm. Journ., Aug. 19, 1899, 180; from Petit Monit. Pharm., *49*, 3315.

Oxolin—A Substitute for Caoutchouc.—C. Grist obtains a caoutchouc-like material which he has named "oxolin" by saturating hemp-tow with linseed oil, spreading the mixture upon a wire screen and heating it for 24 hours in a current of air. The mass is then strongly expressed under a hydraulic press, and converted into a homogenous substance by kneading it between rollers. While not quite as elastic as caoutchouc, the new substance resists an electric tension up to 35000 volts, as well as the action of a temperature of 115° C., and of chemical reagents. The material may be colored to suit.—Pharm. Centralh., Sept. 7, 1899, 556; from Chem. Ztg., 1899, 705.

Celluloid Varnish—Preparation.—Buchheister gives the following method and formula for preparing the so-called "zapon" or "celluloid" varnish from the waste material of celluloid factories: Two parts of colorless celluloid are digested with 20 parts of acetone in a close vessel during several days and with occasional shaking, until a clear, thick mass results. This is mixed with 78 parts of amyl acetate and allowed to clarify by subsidence during several weeks.—Pharm. Centralh., Oct. 5, 1899, 620.

Floor Waxes—Various Formulas.—The following formulas given in "Pharm. Ztg." (*44* (1899), 349) may be convenient for reference:

1. Heat 1 kilo of yellow wax and 1 liter of water to boiling, add 63 Gm. of potash dissolved in a little water, boil the mixture for a few minutes, and remove from the fire; then add 50 Gm. of oil of turpentine, 1 liter of boiling water and 15 Gm. annatto. Stir continually until cold, and apply on a rag.

2. Dissolve 100 parts of yellow wax in 200 parts of oil of turpentine on a water bath.

3. Boil 40 parts of yellow wax, 5 parts of potash, with 160 parts of water;

add 4 parts of oil of turpentine, bring the weight of the whole to 200 parts, and stir continuously until cold.

4. Dissolve 32 parts of potash in 314 parts of water; heat to boiling, add 32 parts of yellow wax, and color the whole with 8 parts of annatto.

Gilding and Silvering Copper—Practical Formulas.—The following formulas for gilding and silvering copper are given in "L'Union Pharm." (*40*, 509):

For gilding, dissolve potassium cyanide, 30, in a little water and add gold and sodium chloride, 10; potassium carbonate, 6; and calcium carbonate, 15. Then add enough water to make a soft paste; apply this to the surface to be gilded, wash off thoroughly with water and dry in sawdust.

For silvering, take silver nitrate, 3; sodium chloride, 2; cream of tartar, 210; mix. Apply by rubbing with a damp rag. For surfaces subjected to rubbing, from which the silver has worn off, the following paste should be applied, and allowed to dry on: Silver chloride, 1; cream of tartar, 2; sodium chloride, 3; water sufficient to make a soft paste. After remaining on the article for some hours, this is washed off with acidulated water, the article dipped in cyanide solution, and again washed.—Pharm. Journ., Jan. 20, 1900, 54.

C. New Remedies.

Acetanilidsulphonate of Sodium.—Obtained by the action at elevated temperature of acid or neutral sulphites of the alkalies or alkaline earths upon nuclear halogen substitution products of acetanilid, and conversion of the free acid obtained into the sodium salt. It forms a micro-crystalline innocuous powder, having feeble acid reaction, which is readily soluble in water, but insoluble in alcohol, ether, chloroform and similar solvents. Medicinally it is recommended as an antipyretic.

Aethol, the name given by Grimm to *Cetyl alcohol* (from spermaceti), is recommended as a dermatological basis for various medicaments, it being absorbed and retained by the skin without imparting greasiness to it. Thus, a mixture of powdered cetyl alcohol and boric acid (1:1 to 1:5) has been used with advantage for rough and chapped hands, moist eczemas, prurigo, etc.—Pharm Ztg., July 26, 1899, 528.

Afral—A New Disinfectant for Damp Cellars, Etc.—Under the name of "afral" a new disinfectant has been introduced, which is recommended for the prevention of fungous growths and decay in damp rooms and cellars. It is applied in usual coatings in the form of 1 to 2 per cent. solution in hot water to the walls and woodwork, which must be previously thoroughly cleaned. Its composition is not indicated.—Pharm. Ztg., Aug. 13, 1899, 584.

p-Alepton.—A colloidal ferro-manganic peptonate.

s-Alepton—A colloidal ferro-manganic saccharate.

m-Amidocinnamic acid Esters.—These are obtained by the esterification of amidocinnamic acid or by the reduction of the corresponding nitrocinnamic acid ester. The

m-Amidocinnamic acid-ethyl ester forms prisms which melt at 63°–64° C., and are soluble in alcohol, ether or chloroform, but insoluble in water or ligroin. The

m-Amidocinnamic acid-methyl ester melts at 84° C. Both of these esters have the therapeutic properties of cinnamic acid, coupled with anæsthetic action.

Aniodol is the name given by Sedan to a solution of trioxymethylene (paraformaldehyde) in glycerin to which a body belonging to the allyl series—not named—is added. The preparation is said to possess energetic bactericidal properties, and is intended to be used in the form of washes and fomentations in the treatment of wounds.—Pharm. Ztg., May 5, 1900, 347; from Rep. de Pharm., 1900, No. 4.

p-Anisidin citrate, primary (*Monoanisidin citrate*).—Obtained by the direct admixture, either in substance or dissolved in alcohol, of p-anisidin and citric acid. It melts at 187° C., and resembles *p-phenetidin citrate* (which see) in its characters and therapeutic properties.

Antiaethylin is the name given by Broca, Sabelier and Thibault to a serum which when injected into the veins of animals as well as man that have acquired and become addicted to the alcohol habit, is said to create disgust for alcohol as a beverage and thus effect a cure. The serum was obtained from horses which had been trained to the voluntary use of alcohol and had acquired a liking for it. When this injected into the veins of other animals, which had also acquired a liking for alcohol, it created a disgust for it, so that they preferred to abstain from food and drink rather than to use such when it contained alcohol.—Pharm. Ztg., Jan. 1, 1900, 87.

Antiherpin, a remedy for herpes, is stated by its manufacturer to be comof: Pix liquida, ol. rapar., āā 100.0; bals. peruv., 10.0.—Pharm. Ztg., May 12, 1900, 366.

Antimellin is the name given by Börsch to a glucoside which he has isolated from the fruits of *Syzygium jambolanum*, and claims to possess valuable effects in the treatment of diabetes. It is a light-yellow, crystalline powder.—Pharm. Ztg., Aug. 16, 1899, 574.

Antineon is, according to Lochner, an alcoholic preparation of sarsaparilla, veronica and portulacca, recommended as a gonorrhœa remedy.—Pharm. Ztg., June 6, 1800, 435.

Antiphlogistin, the name given to a mixture of kaolin and glycerin, recommended as a material for poultices.—Pharm. Ztg., Dec. 13, 1899, 889.

Antitussin, according to Heim, useful in the treatment of whooping

cough, is a salve composed of 5 p. difluorphenyl, 10 p. vaselin, and 85 p. woolfat. It is used by rubbing the salve energetically with the hand on the neck, chest and back of the patient, the skin having previously been lathered and washed, and completely dried with a soft cloth.—Pharm. Ztg., Jan. 3, 1900, 8.

Aqualit.—A new varnish composed of resin, petroleum, oleic acid and a manganese salt. Claimed to be particularly adapted for varnishing moist objects.

Arsencaseinates.—Obtained by boiling casein, suspended in alcohol, acetone, or hydrochloric acid, for several hours with an aqueous or alcoholic solution of a halogen arsenic compound.

Arsycodile, is the name under which cacodylic acid and its sodium salt have been introduced as substitutes for the arsenical preparations usually prescribed. It is supplied in the form of hypodermic solution and solutions for injections, in vials containing 0.025 Gm. of the preparation, and in the form of pills, each containing 0.025 Gm. of sodium cacodylate.—Pharm. Ztg., Dec. 13, 1899, 889.

Aspirin.—Obtained by the action of acetic anhydride on salicylic acid. It forms white crystalline needles, having the composition $C_6H_4.COOH.O.CO.CH_3$, melting at 135° C., readily soluble in alcohol or ether, and to the amount of 1 per cent. in water at 37° C. It is recommended in rheumatism of the joints in doses of 1 Gm. three times daily.

Asterol (*p-Sulphophenol-Mercuro-Ammonium Tartrate*).—Prepared by dissolving 4.32 yellow mercuric oxide in the molecular quantity (20.76) of paraphenolsulphonic acid (33⅓ per cent.), adding 13.44 per cent. crystallized tartaric acid, then neutralizing with 13.5 of ammonia of 20 per cent., and evaporating to dryness on a water-bath while stirring. (For properties, etc., see Proceedings, 1899, 481.)

Asthma Powder—Neumeier—contains: Datura stramonium, lobelia inflata, sodium nitrite, potassium nitrate, potassium iodide, and sugar. The value of the powder as an asthma remedy depends, it is claimed, on its careful composition, and the potassium iodide content, which has hitherto not been used in such powders. It is employed by burning a teaspoonful of the powder on a saucer and inhaling the fumes.—Pharm. Ztg., Jan. 13, 1900, 37

Astra.—A new infant food, containing 12.7 per cent. of albumin, and recommended as a substitute for cow's milk.

Atrabilin is the name given to a preparation obtained from the suprarenal gland. It is a light yellow, slightly opalescent fluid, having an odor resembling that of meat extract and depositing on long standing a small flocculent precipitate, but otherwise possessing stability. It is used in ophthalmic practice in place of cocaine, and, according to Wolffberg, produces all the symptoms, with the exception of mydriasis and anæsthesia,

of that alkaloid in an incomparably higher degree. It is prescribed in the form of eye drops containing: Atrabilin, 2.0; boric acid, 0.5; distilled (or rose) water, 10.0.—Pharm Ztg., March 3, 1900, 173.

Ayapana.—The herbaceous part of *Eupatorium triplinerve*, Vall. (*E. ayapana*), recommended in form of infusion as a tonic and stomachic.

Basicin is the name given by Kreidman to a compound of quinine and caffeine (see under "Organic Bases,") prepared by a patented process, for which, besides great solubility, greater persistence and three times the strength of ordinary quinine are claimed, without the usual unpleasant secondary effects. From this compound a

Basicin oil is prepared according to the following formula: Basicin, dry, 5 Gm.; chloroform, 37.5 Gm.; alcohol, 12.5 Gm.; olive oil, 45 Gm. This is to be used as an external application in cases in which the administration of basicin by the mouth, or by injection, is impracticable; or, in chronic affections, as additional treatment to the internal exhibition.—Pharm. Ztg., Feb. 10, 1900, 116.

Betuol, a liniment containing the methyl-salicylic ether as active constituent and recommended as an embrocation in rheumatic and gouty affections.—Pharm. Ztg., Feb. 17, 1900, 184.

Bromipin—A Bromated Sesame Oil.—Otto Dornbluth conceived the idea of employing a bromated sesame oil, prepared in the same manner as the so called "iodipin," in the treatment of certain nerve diseases, such as neurasthenia, etc. He has obtained a compound containing 10 per cent. of bromine in sesame oil, which is marketed under the name of "bromipin." It has been given with advantage in cases of neurasthenia in teaspoonful doses (containing 0.35 Gm. Br.), and is claimed to possess certain advantages over the alkali bromides. In cases of epilepsy, it has been given with advantage in doses of a tablespoonful.

Bromphthalimid.—Obtained by adding a solution of phthalimid in diluted solution of potassium hydrate into a cold mixture of bromine and water, collecting the precipitate on a filter, drying, and recrystallizing from benzol. It forms a white, crystalline powder, melting at 206 –207° C., and is recommended for the treatment of skin diseases.

Caseinum Vegetabile, an albuminoid obtained from various leguminosæ, employed in place of the impure aleuronates to incite suppuration in bacteriological experiments. It is a fine white powder, which is almost insoluble in water when in the dried state, but readily soluble in diluted alkalies.—Pharm. Ztg., Feb. 28, 1900, 165; from Merck's Annual Report for 1899.

Capsules Cognet.—Gelatin capsules containing: eucalyptol, creosote, of each, 0.03 Gm.; iodoform, 0.05 Gm.

Carboformal-Bricks are composed of weighed quantities of paraformal-

dehyde enveloped in charcoal and formed into bricks, which, according to Enoch, continue to glow when ignited, and generate sufficient heat to convert the paraformaldehyde into gaseous formaldehyde without igniting the latter.—Pharm. Ztg., Jan. 24, 1900, 65.

Cascara Liquide Alexandre.—Prepared from cascara bark, 60; alcohol (60°), 120; Madeira wine, 500; syrup, 250; distilled water enough to make 1000 parts.

Cephalin is a mixture of antipyrine and roasted coffee, of each, 5.0, and of coffeine and sodium salicylate, of each, 2.0.—Pharm. Ztg., April 21, 1900, 307.

Chielin, a soft cream prepared from tulip bulbs with olive oil, and recommended for all kinds of skin diseases. It is also supplied in form of a hard soap, which is stated to have the following composition: Olive oil soap, glycerin, birolin, talc, zinc oxide, tinct. of benzoin, extr. bulb. tulipeæ africanæ and water.—Pharm. Ztg., Jan. 3 and 31, 1900, 8 and 87.

Chinosol—A Mixture, Not a Definite Compound.—According to the statements of its manufacturers, the preparation introduced under the name of chinosol is to be regarded as the potassium salt of oxyquinolinsulfonic acid (or oxyquinoline alum), having the formula $C_9H_6NOSO_3K + Ag$. It is also stated to be almost completely insoluble in absolute alcohol. Sonntag, however, finds that on shaking this product with absolute alcohol it is partly dissolved, producing a yellow solution and leaving a white, crystalline residue. The solution contains oxyquinoline sulphate; the residue is potassium sulphate. Moreover, these two are not even present in molecular proportions, as the author has determined by analysis. It is evident, therefore, that by the action of potassium pyrosulphate on oxyquinoline no definite compound is produced, as claimed by its introducer, but simply a mixture of oxyquinoline sulphate and of potassium sulphate. The yellow color of the alcoholic solution is characteristic for salts of oxyquinoline, these having the same color in their dry crystallized condition. Oxyquinoline, in the uncombined state, on the other hand, crystallizes in colorless needles.—Pharm. Ztg., Oct. 26, 1899, 771; from Mittheil aus d. kais. Gesundheitsamt, xv., 2.

Chirol, a disinfectant fluid recommended for the protection of the hands of the operator in surgical cases, and, according to R. Kossmann, well adapted for this purpose. It is a clear yellowish fluid, composed of certain resins and fixed oils dissolved in a mixture of ethers and alcohols of low boiling points—Pharm. Ztg., June 28, 1900, 483.

Chloretone.—The mode of preparing chloretone is as interesting as it is simple. Its formula is as follows: $C_4H_6Cl_3HO$, and it is formed when caustic potash is slowly added to equal weights of chloroform and acetone, from which mixture it may be isolated, after the removal of any excess of these products, by distilling with steam. Ob-

tained in this manner it is a white crystalline compound with a camphoraceous odor, and when freed from water by melting, and allowed to cool, the camphoraceous odor is more pronounced, and its general appearance resembles camphor more closely. It is very soluble in chloroform, acetone, strong alcohol, ether, benzin and glacial acetic acid, sparingly soluble in cold water (1 per cent.), more soluble in boiling water. It is dispensed both in tablets and in crystals.—Amer. Drugg, Jan. 10, 1900, 12.

Chlorosonin is a compound of chloral hydrate and hydroxylamine, which is resolved into its components in the presence of water, and is said to have the hypnotic effect of chloral hydrate.—Pharm. Ztg., April 21, 1900, 307.

Chrysolein is a preparation of sodium fluoride recommended by Villen for the preservation of foods.—Pharm. Ztg., Feb. 28, 1900, 166.

Colchisal, a preparation of colchicine and salicylic acid, recommended for internal use in gout, etc.—Pharm. Ztg., Feb. 17, 1900, 184.

Creosin is the name given by Bosio to a creosote preparation, which is said to be devoid of caustic action and free from the bad taste of creosote. It is a clear yellow fluid, containing besides iodine also calcium hypophosphite and balsam of Peru, miscible in all proportions with water, wine, milk, etc.—Pharm. Ztg., June 16, 1900, 461.

Crurin—A New Antiseptic—Quinoline—bismuth — sulphocyanide has been introduced into medicine, as an antiseptic, under the name of "crurin." It has the composition $(C_9H_7N.HSCN)_2Bi(SCN)_3$, it melts at 76°C. and occurs as a coarse powder of reddish yellow color with a somewhat sharp odor; it is insoluble in alcohol, water and ether. By treatment with excess of cold water, or by heating with diluted mineral acids, or by prolonged heating with alcohol, it is decomposed, otherwise the salt is very stable and may be kept for long periods. When dusted on slight secretions it forms a brown scab under which the wound rapidly heals.—Pharm. Ztg., Jan. 10, 1100, 27.

Cupriaseptol.—The salts of a phenolsulphonic acid, probably of *m*-phenolsulphonic acid.

Djoeat, a nostrum highly lauded as a remedy for diabetes, and supposed to be a revival of the preparation introduced a year ago under the name "djoeatin," a preparation claimed to be prepared from jambul fruits.—Pharm. Ztg., Feb. 17, 1900, 184.

Dithan.—Trional.

Dolomol is a mixture of the calcium and magnesium salts of stearic and palmitic acids, which is recommended on account of its smooth texture and neutral character as a vehicle for various medicaments—sulphur, boric acid, calomel, resorcin, etc., in dermatological practice. — Apoth. Ztg., 1900, 127.

Dormiol.—Dimethylethylcarbinol chloral or amylene chloral, used as a hpynotic in doses of 0.5 to 3.0 Gm.

Durinum.—The name applied to a plaster for the navel, composed of superimposed discs of caoutchouc plaster.

Ecthol.—An antiseptic compound said to contain the active constituents of *echinacea* and *thuja*.

Egols.—In addition to phenegol, previously described (see Proceedings 1899), Gautrelet describes an entire series of egols. The *a*-nitrophenol-(cresol-, thymol-) *p*-sulphonates of mercury are very permanent compounds. They constitute brown-red powders, crystallize with difficulty in rhombohedra, and are soluble in all proportions of water, forming odorless and tasteless solutions, neutral in reaction, and free from caustic or irritant character. They are powerful bactericides, but devoid of poisonous properties, although they are capable of inciting emesis.—Pharm. Ztg., July 26, 1899, 528.

Endomentol.—A salve composed of lanolin and vaselin with 0.1 per cent. of nicotine salicylate. Used for the treatment of itch.

Eosolates are the salts of the sulphoacids of aliphatic creosote-esters, prepared under a process patented by Dr. Wendt. Thus,

Eosolate of Calcium is the calcium salt of trisulphoacetyl-creosote $(C_9H_7S_3O_{12})_2Ca_3$, a grey powder having a somewhat pungent ethereal odor and a slightly acrid taste. It is soluble in 8 to 10 parts of cold water, sparingly soluble in alcohol, insoluble in chloroform and turpentine, but readily soluble in hydrochloric or citric acid. The new compound is recommended as an antiseptic and for the treatment of diabetes, phthisis, nephritis, etc., the dose being 0.3 to 0.75 Gm. several times daily. The

Eosolates of Silver and of Quinine are also prepared, the first named being recommended as a remedy for gonorrhœa, the last for the treatment of malaria and influenza.—Pharm. Ztg., May 26, 1900, 407.

Epicarin—A New Parasiticide.—Under the name of "epicarin" a chemical compound belonging to a new class of oxycarbonic acids, of which the derivatives of phenol, resorcin, pyrogallol, thymol, guaiacol, etc., have been prepared, has recently been introduced as a remedy in parasitic skin diseases. Epicarin is chemically the β-naphthyl derivative, and may be designated as

Oxynaphthyl-o-oxytoluylic Acid. It is marketed in two forms, the one colorless or faint yellowish, designated as "Epicarinum Purum," the other of a reddish color and designated as "Epicarinum Veterinarium." The latter easily yields the former by simple recrystallization from glacial acetic acid, but the colorless scales so obtained retain some of the acetic acid, which they lose on heating to 120° C., or which may be removed by subsequent recrystallization from alcohol or benzol. Pure epicarin forms

colorless needless melting at 199°. It has been found useful for a variety of dermatological purposes, particularly for scabies and dermatomycoses. Good results have been obtained with it in prurigo, herpes tonsurans, and in certain eczemas, and it possesses the additional advantage of being non-poisonous and cleanly.—Apoth. Ztg., Feb. 21, 1900, 126.

Eugenoform (*Eugenol-Carbinol-Sodium*) is recommended by Vogel on account of its bactericidal properties for the disinfection of the stomach and intestinal tract in cholera, typhus and other infectious diseases. It may be given in doses of 0.5 to 1.0 Gm. morning and night, and occurs in colorless crystals, melting at 160° C., which are readily soluble in water, but with difficulty in alcohol.—Pharm. Ztg., Aug. 16, 1899, 574.

Eugot is an antiseptic said to consist essentially of -naphthol, eucalyptol, salol, menthol, boric acid, extract of witch-hazel and small quantities of formaldehyde.—Pharm. Ztg., May 12, 1900, 366.

Ferratogen is a nuclein iron preparation obtained by cultivating yeast on culture media containing iron, and after isolating it from this, subjecting it to peptic digestion, and washing the product with alcoholic hydrochloric acid until the reaction for iron disappears completely. The product nevertheless retains iron to the amount of 1 per cent. It is a yellow-gray powder, insoluble in water, and not affected when exposed to the digestive action of the gastric juice during three days, while under the influence of pancreatic extract solution is extremely slow, and is not completed until after several days. M. Cloetta has, however, found that notwithstanding this resistance to ordinary digestive action, it is absorbed readily when it reaches the intestines; while in the stomach it is completely insoluble, and consequently produces no disturbance of the digestive functions during its administration.—Pharm. Ztg., June 6, 1900, 435.

Ferratose.—A new liquid iron preparation.

Ferric Lanolin. — Prepared from iron sesquichloride, 30.0: distilled water, 3.0; lanolin, 50.0. Recommended locally in diphtheria.

Fersan is a paranucleoproteine compound of iron obtained from the fresh blood of neat cattle. According to A. Jolles it is soluble in water, non-coagulable on boiling, and passes undecomposed through the stomach, but is completely absorbed in the intestinal tract. It contains iron and phosphorus in organic homomolecular form, together with about 90 per cent. of albuminoids, and is recommended as a tonic and nutrient.—Phar. Ztg., May 16, 1900, 378.

Formaldehydbisulphite, obtained by evaporating an aqueous solution of sodium bisulphite and formaldehyde to crystallization, is recommended as an antiseptic in L'Union Pharm., 1900, No. 6.

Fortoin is the name given by Overlach to a compound obtained by the action of formaldehyde on cotoine. It is recommended as an antidiarrhœi-

cum in doses of 0.25 Gm. thrice daily. Pharm. Ztg., March 17, 1900, 211.

It is chemically "methylenedicotoine," and occurs in handsome yellow crystals, or in powder—m. p. 211–213° C.; readily soluble in chloroform, actone and glacial acetic acid, sparingly in alcohol, ether and benzol, insoluble in water.—Ibid., 240.

Gasterin is the name given by Frémont to the gastric juice of dogs, which, according to Bardet is a more potent digestive agent than those ordinarily employed for artificial digestion. A considerable portion of the free hydrochloric acid combines with the albuminoid substances, and thus approaches in its effects that of the physiological process of digestion. —Pharm. Ztg., May 16, 1900, 378.

Gaultheroline.—Applied externally in muscular and other forms of rheumatism, in neuralgia, migraine and similar ailments.

Glacier Salve (*Gletscher Salbe*).—Composed of zinc oxide, starch, lanolin and cold cream. Recommended for the treatment of "snow-burns" (Schneebrand) incident to mountain climbing.

Glutektones.—Gelatin pencils formed from the medicated gelatins recommended by Unna, particularly of the oxide of zinc gelatin, for convenient use.

Guaiacolcacodylate, a compound of cacodylic acid and guaiacol, recommended by Barbary as a useful arsenical preparation for the treatment of tuberculosis. It is administered hypodermically in doses of 0.03 to 0.05 Gm., and is said to have given good results in cases of tuberculosis in which it was so employed.—Pharm. Ztg., Feb. 17, 1900, 184.

Guajakinol is the name given by M. J. Castel to the dibromguaiacolate of quinine. It crystallizes in clinorhombic prisms of a handsome yellow color, and is very soluble in water, requiring 1.25 p. at 15° C. and less than half its weight at 30°.—Pharm. Ztg., June 16, 1900, 461.

Guaiamar is the name given by Endeman to the guaiacolglycerylester, $C_6H_4.OC_3H_7O_2.OCH_3$, obtained by the action of guaiacol upon anhydrous glycerin. It is a dry, white, crystalline powder, melting at 75° C., soluble in alcohol, chloroform, ether and glycerin, and in 20 parts of water, at the ordinary temperature. It has a bitterish, aromatic taste, and is said to possess antiseptic action, being split up in the stomach into glycerin and guaiacol. Dose: 0.2 to 1.0 Gm.—Pharm. Ztg., Feb. 10, 1900, 116.

Gujasanol—A Water-Soluble Substitute for Guaiacol.—Dr. Alfred Einhorn and Dr. Hütz have prepared the hydrochloride of diethylglycocollguaiacol, which has now been introduced under the name of "gujasanol," as a substitute for guaiacol, and the guaiacol-esters hitherto in use, on account of its superior solubility in water, its comparatively non-toxic character, and its non-irritant property when applied to wounds in form of 2 per cent. solution. It splits off guaiacol when introduced in the organ-

ism, and in its antiseptic value it corresponds about to that of boric acid. It crystallizes in white prisms, melting at 184°, having a faint odor of guaiacol, a saline, bitter taste, and extraordinary solubility in water, forming neutral solutions from which carbonated alkalies precipitate the free diethylglycocoll-guaiacol in the form of a basic oil.—Pharm. Centralh., Feb. 15, 1900, 92.

Gynocardia Soap is recommended by Unna in place of gynocardia (chaulmoogra) oil, which is recommended as an efficient remedy for lepra, but possesses unpleasant secondary effects which are not manifested when the soap is used. The method recommended for the preparation of the soap is given elsewhere under "Pharmacy," as also the formula for preparing pills from it.—Pharm. Ztg., Feb. 10, 1900, 116.

Hedonal is "methylpropylcarbinolurethane," and a new hypnotic, highly recommended by F. Goldmann on account of its prompt action and the absence of unpleasant secondary effects. It is recommended particularly in ordinary cases of insomnia, and more especially in the neurasthenic and hysteric affections of women.—Pharm. Ztg., April 11, 1900, 282.

Hedonal forms colorless crystals which melt at 76° and boil at 215°C.; are soluble in boiling water and less soluble in cold water, producing solutions having a taste strongly reminding of peppermint. On boiling with alkalies it is decomposed with formation of carbonate, methylpropylcarbinol and ammonia.—Ibid., May 5, 1900, 347.

Honthin—A New Tannin Product—In a lengthy paper, accepted and produced among the original articles in "Pharmaceutische Post" (Nov. 12 and 19, 1899, 627–628 and 643–645), Dr. Aba von Sztanskay extols the therapeutic virtues of a preparation he has named "honthin," a fanciful name probably derived from the locality in which he resides. He fails to give the slightest clue concerning the method of its preparation, confining himself to the simple statement that "after experiments covering several months I succeeded in preparing a compound containing a high percentage of tannin, the solubility of which in the juices of the stomach is by 100 per cent. less than that of the tannalbin of Knoll, *i. e.*, the quantity reaching the intestinal tract, therefore the therapeutic action of the preparation is twice as great as that of Knoll's tannalbin." The remainder of the paper is devoted chiefly to a criticism of the therapeutic value of tannalbin and tabulated statements of comparative experiments by which he seems to prove the superiority of "honthin." The latter is here referred to so that pharmacists may have knowledge of the existence of such a preparation—the manner of the reference, to give food for reflection to both pharmacists and medical practitioners.

Hydromise Cotton is the name applied to a cotton saturated with a fatty body and impervious to water, which is recommended by Knopf for the protection of the center of the ear against moisture, in cases of perforation of the ear-drum.—Pharm. Ztg., Sept. 13, 1899, 648.

Ibit is the name given by C. Brunner and C. Meyer to bismuth oxyiodotannate, a compound closely related to airol, which is bismuth oxyiodogallate. It is a greenish gray, odorless and tasteless, minutely-divided powder, which may be readily dusted by means of a blower, and is employed either as dusting powder or in the form of salves and lotions.—Pharm. Ztg., Feb. 10, 1900, 116.

Idonaftan is a naphtha ointment containing about 3 per cent. of iodine, and recommended as an efficient substitute for naphtalan. It is an exceedingly smooth, stable ointment, of a black-brown color, appearing dark green by transmitted light, and has a pleasant odor.—Pharm. Ztg., April 11, 1900, 282.

Igazol is a preparation recommended by Cervello for the treatment of tuberculosis by inhalations, and is said to be composed of formaldehyde, paraformaldehyde (trioxymethylene) and an iodine compound of unexplained nature. When this compound—a powder—is heated, formaldehyde is developed.—Pharm. Ztg., June 16, 1900, 461.

Ixodin is a ferment extracted by Sabbatani from wood-ticks by the aid of physiological sodium chloride solution, which is said to prevent the coagulation of blood. When injected into the veins it reduces the heart's action and slackens the respiration, eventually causing the complete cessation of these functions.—Pharm. Ztg., June 6, 1900, 435.

Kineurin is quinine glycerophosphate.

Laurenol.—A disinfectant solution of aluminum chloride, zinc sulphate and iron sulphate in water, is marketed in two forms, the one (I) for medicinal use, the other (II) for disinfection. The following formula is given in "Bull. de Pharm. du Sud-Est.": Copper sulphate, 50 Gm.; zinc chloride, 35 Gm.; alum, 15 Gm.; hydrochloric acid, picric acid, of each, 10 Gm.; glycerin, 100 Gm.; water, enough to make 1000 Cc.—Pharm. Centralh., Sept. 21, 1899, 575 and 576.

Lavoderma is a medicinal soap, containing about 30 per cent. of mercurial caseinate, and is recommended on the ground of its non-irritant qualities.—Pharm. Ztg., May 26, 1900, 407.

Lenigallol (*Triacetylpyrogallol*).—Obtained by boiling for two hours 10 parts of pyrogallol, 25 parts of acetic anhydride and 1 part of anhydrous sodium acetate, allowing the product of the reaction to crystallize, collecting the crystals on a filter, and washing them with water. It forms snow-white crystals, which melt at 165° C.

Levurine is purified and dried "sedimentary" beer yeast, recommended in recent years as a tonic and antiseptic, and used internally as a gentle aperient, and in the treatment of scrofula and typhoid fevers. It is also used in the liquid form purified. The dried yeast is given in doses of 1 to 3 teaspoonfuls, mixed with a little beer, before meals.—Pharm. Ztg., Feb. 28, 1900, 165; from Merck's Ann. Rep., 1899.

Lipogenium, liquid and solid. — Mixtures of palmitic- and iso-oleic acid esters in variable proportions; used as additions to salves, solvent for iodine, etc.

Listulin Preparations, in the form of lint, plaster, collodion, etc., are introduced by Wheeler. They are prepared by subliming betulin direct upon the fabric, or causing the sublimate to be absorbed by the fluids intended to be rendered aseptic.—Pharm. Ztg., Jan. 10, 1900, 27.

Mercuriol.—Aluminum-magnesium amalgam in an extremely finely divided state. Used in syphyiiis.

Meta-Vanadic acid. — Recommended in chlorosis, tuberculosis, and in subacute and chronic rheumatism, in doses of 0.00045 Gm. per day.

Methenyldi-o-anisidin. — Obtained by prolonged heating of o-anisidin with orthoformic acid ester. Used as a local anæsthetic.

Methylacetanilidsulphonate of Sodium.—Obtained in a manner analogous to that of preparing *acetanilid-sulphonate of sodium* (which see). Used as an antipyretic.

Methylpropylcarbinolurethane, a member of the amylurethanes, is the most modern of the hypnotics, and, according to Dreser, possesses a more powerful hypnotic action than the urethanes of the primary alcohols. It has about double the hypnotic strength of chloral, and may therefore be given in doses of 0.5 to 1.0 Gm., dissolved in water or 50 per cent. alcohol, to produce sleep.—Pharm. Ztg., Feb. 28, 1900, 165; from E. Merck's Ann. Rep., 1899.

Monoacetylresorcin.—Obtained by the esterification of resorcin with acetylchloride or acetic anhydride, avoiding strong heating. A syrupy liquid, boiling at 283° C., and recommended as a substitute for resorcin in the treatment of skin diseases.

Monoanisidin citrate: See p-anisidin citrate, primary.

Monophenetidin citrate: See p-phenetidin citrate, primary.

Naphta saponata, *Naphtasapol*, *Petrosapol* and *Sapotan* are naphtha soaps introduced as substitutes for "naftalan."—Pharm. Ztg., March 28, 1900, 240.

Nectrianin, a liquid preparation obtained from *Nectria ditissima*, the crab-parasite of vegetation, and recommended by Bra and Mongover as possessing specific action against carcinoma.—Pharm. Ztg., March 28, 1900, 240.

Negrolin.—A new disinfectant.

Nitro-Propiol Tablets, introduced by Peusch for the convenient determination of sugar in urine, their efficiency for this purpose depending upon the fact that when nitrophenylpropiolic acid is heated with glucose in the presence of soda, a precipitate of indigo is produced. The test is made

by dissolving a tablet in 10 Cc. of water, adding 10 drops of urine and boiling moderately during 3 to 5 minutes, when in the presence of diabetic sugar, an indigo blue color results. The reaction is not vitiated by the presence of uric acid, creatinin, glyconic acid, gall-pigments, nor medicinal substances, such as rhubarb, senna, turpentine, iodine, salicylic acid, etc.—Pharm. Ztg., Jan. 3, 1900, 8.

Nucleol is stated to be pure nucleïn, and is supplied in form of a whitish powder, readily soluble in warm water, but insoluble in alcohol—its solubility in water being augmented by the addition of dilute alkali. If freshly precipitated mercuric oxide is added to an aqueous solution of nucleïn, prepared from yeast, it is gradually dissolved, solution being accelerated by heating. On addition of absolute alcohol to the solution so obtained, a solid compound of nucleïn and mercury is obtained in the form of a voluminous precipitate. In a similar manner, compounds of nucleïn with copper, silver and iron may be obtained, all of these being characterized by ready solubility in water, particularly with the aid of heat. These compounds have been introduced under the following names:

Cuprol, a green powder, containing 6 per cent. Cu.

Ferrinol, a cinnamon-brown powder, containing 6 per cent. Fe.

Nargol, a light brownish-white powder, containing about 10 per cent. Ag.

Mercurol, a brownish-white powder, containing 10 per cent. Hg.

These compounds do not precipitate albuminoids, and are, therefore, of special value for the treatment of wounds, being free from the more or less irritant action of other compounds of the same metals.—Phar. Ztg., May 5, 1900, 346.

Nural, the new name for the nutrient and digestive specialty heretofore marketed under the name of *Nutrol*.—Pharm. Ztg., Jan. 3, 1900, 8.

Osteogen is the name given by Ziegenbruch to a syrup of iron and calcium phosphate, containing in 100 Cc., 3.1022 Gm. calcium phosphate and 0.2661 Gm. acid ferric phosphate, and recommended in the treatment of rhachitis and similar ailments.—Phar. Ztg., Feb. 10, 1900, 116.

Oxymethylphthalimid.—Obtained by heating phthalimid with formaldehyde, with or without pressure. Composition: $C_6H_4.CO.CO.NCH_2OH$. Used as an antiseptic for wounds.

Ozalin water.—This is a carbonated water containing magnesium dioxide.—Pharm. Ztg., Jan. 13, 1900, 37.

Papillin, recommended by Dr. R. Th. Melenreis as a hair restorative, is obtained by digesting 15 Gm. of orris root with 100 Gm. alcohol, and adding 50 Gm. spirit of lavender and 15 Gm. tincture of benzoin.—Pharm. Ztg., May 12, 1900, 366.

Perl-Collodium, according to B. Crede, a somewhat slowly drying collodion, containing no ether and forming a stronger and more adhesive pellicle than ordinary collodion.—Pharm. Ztg., June 28, 1900, 483.

Phenacetinsulphonate of Sodium.—Preparation analogous to that of "acetanilidsulphonate of sodium" (which see). A micro-crystalline, white powder, possessing the advantage over phenacetin in its solubility in water and innocuousness. Used as an antipyretic.

Phenegol.—The mercuro-potassium salt of nitroparasulphonic acid. A red-brown, odorless and tasteless powder, containing 33 per cent, of mercury, and soluble in cold water in all proportions. Used as an antiseptic.

p-Phenetidin citrate, primary (monophenetidin citrate). Obtained by mixing equivalents of *p*-phenetidin and citric acid, either in substance or in solution (alcohol). It forms white, odorless prisms, having the taste of citric acid, which are readily soluble in water, but sparingly in alcohol. Used in rheumatic and febrile ailments.

Phenoleum.—An antiseptic fluid, composed mainly of purified American (oil of? Rep.) turpentine, perfumed with a volatile oil, presumably oil of melissa.

Pictolin is a mixture of liquefied gases, probably mainly composed of sulphurous acid, introduced by Pictet for the fumigation of vessels, storehouses, etc.—Pharm. Ztg., Feb. 28, 1900, 166.

Plasmon (Kascon).—Composition and Nutrient Value.—According to the experiments of Dr. M. Wintgen, the milk preparation known under the name of "plasmon" is composed of: water, 10.66 per cent.; nitrogenous substances (nitrogen, 11.07×6.37), 70.51 per cent.; fat, 4.40 per cent.; milk sugar, 4.20 per cent.; inorganic substances (ash), 6.96 per cent. The ash is composed of 5.14 per cent. potassa, 16.78 per cent. soda, 1.61 per cent. magnesia, 32.68 per cent. lime, 38.56 per cent. phosphoric acid, 3.60 per cent. carbonic acid, 1.70 per cent. chlorine, and 1.62 per cent. sulphuric acid. The alkali salts naturally existing in milk being for the greater part removed with the whey during the process of preparing plasmon, its alkali content is largely due to added sodium bicarbonate. The author regards plasmon as being a valuable albuminoid dietetic for the sick, the digestible nitrogenous substances contained in it being utilized to the extent of 95 per cent.—Apoth. Ztg., Dec. 9, 1899, 740: from Ztschr. f. Unters. d. Nahr. u. Genussm., 1899, 761.

Propolisin, a red-brown, somewhat opalescent fluid, is recommended as a disinfectant and antiseptic, and claimed by its introducer to be a product of the dry distillation of beeswax. — Pharm. Ztg., May 5, 1900, 347.

Protargol—Use of Glycerin to Expedite Solution in Water.—According to Kopp concentrated solutions of protargol are obtained with great ease and rapidity if the protargol is preliminarily triturated with an equal weight of glycerin before adding the water. The proportions of such a solution may be as follows: Protargol, 2, glycerin, 2, tepid distilled water, 3 parts. — Apoth. Ztg., Dec. 23, 1899, 775; from Münch. Med. Wochenschr., 1899, No. 50.

Pyrantin-Soluble, according to Gioffredi the sodium salt of pyrantin (p-ethoxyphenylsuccinimid) employed as an antiseptic in the same way as pyrantin.—Pharm. Ztg,, July 1, 1899, 460.

Quinine Chloride-sulphate, produced on account of its easy solubility in water (equal weight) for hypodermic use. It is obtained by dissolving 30 Gm. of the ordinary quinine sulphate in 24 Cc. of hydrochloric acid, sp. gr. 1,050, and evaporating the solution to crystallization. It is an odorless, bitter, crystalline powder, containing the same percentage (74 per cent.) of quinine as the official sulphate. — Pharm. Ztg., June 28, 1900, 483.

Resaldol—A New Intestinal Antiseptic.—A. Eichengrün has given the name "resaldol" to a condensation product of μ-chlormethyl-salicylaldehyde and resorcin. It is a light brown powder, soluble in alcohol, acetone, acetic ether, and hot glacial acetic acid, but insoluble in water, ether, ligroin, benzol and chloroform. It has powerful bactericidal properties in alkaline media as well as in neutral solutions, and is therefore particularly useful as an intestinal antiseptic.—Apoth. Ztg., April 14, 1900, 254.

Resorbin Mercury is a substitute for mercurial ointment prepared with the new specialty "resorbin" as a base in the proportion of 1 : 3.—Pharm. Ztg., March 3, 1900, 173.

Sapodermin is a medicinal soap, said to contain mercury in form of albuminate (caseinate) and claimed to possess strong bactericidal properties, while devoid of irritant, caustic or poisonous properties, and therefore constituting an innocuous substitute for corrosive sublimate soap for antiseptic washings and for the treatment of parasitic affections of the skin.—Pharm. Ztg., Feb. 10, 1900, 116.

Saponaceous Mercurial Ointment.—Composed, according to Schuster, of mercury, 33.33 ; white olein soap, 12.66 ; filtered suet, 18.00 ; filtered lard, 36.00. The proportions of the last two are varied according to season.

Septicidin is a serum preparation used in the treatment of erysipelas in hogs, hog cholera and chicken cholera, obtained from the blood of highly immunized animals. If preserved cool, but free from frost, it retains its activity for at least half a year.—Pharm. Ztg., Jan. 10, 1900, 27.

Sicco—Trade-Name for Dry Hæmatogen.—Schneider describes *dry* hæmatogen, to which he has given the name of "sicco," as forming red-brown, tasteless and odorless crystals, which keep well without any addition of glycerin, alcohol, or other preservatives. It is free from all blood impurities, digested by the gastric juice to the extent of 99 per cent., and contains 89.32 per cent. of albumen, 0.332 per cent. of organic iron, 2.6 per cent. of mineral matter, and 0.11 per cent. of fat. It dissolves readily in cold water, its solution being coagulable by heat.

To make *liquid hæmatogen*, 80 parts of sicco are dissolved in 400 parts of distilled water ; a solution of 2 parts of sodium hydroxide in 278 parts

of water is then added, and this is followed by 120 parts of syrup, 120 parts of 90 per cent. alcohol, and 5.5 parts of aromatic tincture. After standing three days, the solution is filtered.—Pharm. Ztg., 1900, 87.

Sidnal is the trade name for a new gout remedy composed of piperazine (-diethylenediamine) and kinic acid. It is given either by itself, or in combination with phenocoll, lithium compounds, etc., and in its combination with lithium citrate has heretofore been known under the name of *urosin*.—Pharm. Ztg., March 7, 1900, 182.

Sodium Superoxide Soap.—Prepared by incorporating from 2 to 20 per cent. of sodium superoxide with a mixture of 2 parts of liquid paraffin and 7 parts of perfectly dry medicinal soap. Used in acne and rosacea pustulosa.

"*Solfuro Oil*"—*A Product from Olive Residues*—According to a recent Consular (British) Report, extensive works exist in the Milazzo (Italy) district for the manufacture of a product from the residue of olives, from which the oil has been extracted. This product is called "solfuro oil" and is used in the manufacture of soap. The final residue is used as fuel. The average annual production of this by-product is about 1,000 tons.

Spleniferrin—A Preparation from the Spleen of Cattle.—Dr. B. Rhodes calls attention to a preparation obtained by mixing the pulped and dried spleen of neat cattle with a certain proportion of iron in form of albuminoids, the spleen itself containing in the case of older animals nearly 5 per cent. of iron, or nearly thrice as much as that of young animals. The new chalybeate is recommended by reason of its ready assimilation into the human organism, and because it may be given for a long period without inconvenience.—Apoth. Ztg., Dec. 13, 1899, 749; from Dtsch. Med. Ztg. (Ther. Beil.), 1899, 83.

Staphylase is the name given by Doyen to a product obtained by him in the form of a yellow powder from beer-yeast, of which he claims it to be the active principle, and which it is intended to replace for therapeutic use (see also "Levurine").—Pharm. Ztg., March 17, 1899, 211.

Sudol—A mixture of adeps lanæ and glycerin, containing 3 per cent. of aldehyde. Recommended for foot-sweat.

Sudoral, recommended as an addition to foot-baths for sweating feet, is an acid fluid, giving a strong sulphur reaction, and is said to contain benzoic, boric and tartaric acid in a medium composed of alum solution.—Pharm. Ztg., Jan. 3, 1900, 8.

Sulfosot.—A syrup containing 5 per cent. of guaiacolsulphonate of potassium and 5 per cent. of cresolsulphonate of potassium. Given in tuberculosis in teaspoonful doses.

Tartaric acid diphenylester.—Obtained by the condensation of tartaric acid and phenol by means of phosphoric oxychloride, and constitutes fine,

silky-glistening needles (m. p. 101°–102° C.), having a faint aromatic odor, which are insoluble in water, difficultly soluble in cold alcohol, but readily soluble in hot alcohol, in ether and in glycerin. Used in the treatment of gout.

Tenalgin is stated to be a mixture of the alkaloids of the areca nut, and is recommended by its introducer as a remedy for tape-worm in animals. —Pharm. Ztg., Feb. 10, 1900, 116.

Thymolcarbonate.—Obtained by passing phosgene gas into a 20 per cent. sodium hydrate solution holding a calculated quantity of thymol in solution. A nearly tasteless, light yellow, syrupy liquid, intended for the convenient administration of thymol.

Tortoine—A New Cotoine Derivative. — A product resulting from the reaction of formaldehyde upon cotoine has been introduced into medicine under the name of "tortoine." It occurs in small, yellow, tasteless crystals, having a faint, cinnamon odor. It is insoluble in water, sparingly soluble in alcohol and ether, but readily dissolved by chloroform, acetone, glacial acetic acid and alkalies. It is given — purpose not named — in doses of 0.25 Gm. three times in 24 hours.—Pharm., Journ. May 19, 1900; 530; from Journ. de Pharm. d'Anvers, 56, 138.

Vegetale.—A yellow mass, semi-liquid at the ordinary temperature, but retaining its fluidity for quite a while after melting. It is said to be impure cotton-oil-stearin.

Zinol.—A mixture of zinc acetate, 1 part and alumnol, 4 parts. Used as a wash (3 : 1000) in gonorrhœal affections of women.

MATERIA MEDICA.

A. Vegetable Drugs.

General Subjects.

The British Pharmaceutical Society's Materia Medica Museum—Notes on Some of its Contents.—It having been suggested to Dr. E. M. Holmes, Curator of the British Pharmaceutical Society's Museum, that he communicate some information concerning the Museum and its contents as being useful to students of pharmacy, the more particularly since the Museum catalogue has been out of print for some years, Dr. Holmes has consented to write a series of papers on this subject, beginning with a general introduction, in which he discusses the scope, contents and arrangement of the Museum. This, as intended, is of interest mainly to students that have access to the Museum; but the subsequent papers which have appeared in

the Pharmaceutical Journal possess general interest, and have been abstracted for this report in the degree their contents have justified.—Phar. Journ., Nov. 25, 1899, 495.

Flora Filippinensis.—Attention is directed by Hans M. Wilder to a copy of the celebrated "Flora Filippinensis," of Blanco, Mercado and Llanos, edited by Naves and Villar, Manila, 1877–1880, which may be found among other rare and costly works on the top floor of the Free Library of Philadelphia. A synopsis of the contents of this work, which consists of two big folios plates, and four folios text, is given by the author, for handy reference, in Amer. Jour. Pharm., March, 1900, 128–129.

Mexican Medicinal Plants — Information Concerning Popular Reports and Use.—In contributions from the U. S. National Herbarium (Vol. 5, No. 4), J. N. Rose presents some notes upon the plants which are employed in one way or another by the Mexicans, his information being derived from the natives, and especially from the Indians of the Sierra Madre, and is given as it was told to him. The native plants used as medicines, or supposed to have medicinal properties, are legion, and many of these, doubtless, have little or no real value. The country people and Indians seem to have little knowledge of medicine, generally using teas made of bitter and strong-smelling herbs. The author gives information concerning the following plants, which can here be mentioned only in their botanical relations, with the local names by which they are known to the natives and the part used:

FILICES. — *Adiantum capillus-veneris*, L. "Celantillo de ojo de agua." The dried fronds.

Polypodium lanceolatum, L. "Lengua de Cervo." The dried fronds.

LILIACEÆ.—*Aloe* sp.—"Savila." The leaves.

CHENOPODIACEÆ.—*Chenopodium incisum* (L.) Poir. "Ipazote del Zorillo."

MAGNOLIACEÆ.—*Magnolia* sp.—"Corpus." The flowers.

ANONACEÆ.—*Anona* sp.—Local name not given. The bark.

LAURACEÆ. - *Litsea glaucescens*, H. B. K. var. "Laurel." The leaves.

LEGUMINOSÆ. — *Enterolobium cyclocarpum*, Griseb. "Huincastle." The bark.

Leucaena sp.—"Tepahuaje." The bark.

ZYGOPHYLLACEÆ. — *Covillea tridentata* (D. C.) Vail. "Gobernadora." The leaves and branches.

MELIACEÆ—*Swietenia humulis* (?), Lucc. "Flor de Venodilla." The seed.

EUPHORBIACEÆ—*Acalypha phleoides* (?), Cav. "Yerba del Cancer." The leaves, flowers and stems.

Euphorbia, sp.—"Yerba de Coyotte." The entire plant.

Euphorbia, sp.—"Yerba de Golondrina." The entire plant.

Jatropha curcas, L.—"Sangre Grado." The seeds.

RHAMNACEÆ—*Karwinskia humboldtiana*, Lucc.—"Margarita." The leaves.

MALVACEÆ—*Anoda hastata*, Cav.—"Altea." The leaves.

TURNERACEÆ—*Turnera humifusa* (Presl). Endlich.—"Damiana.' The leaves and twigs.

POLEMONIACEÆ.—*Loeselia coccinea*, Don.—"Espinocilla." The leaves and stems.

Loeselia, sp.—"Hinseseli." The leaves.

VERBENACEÆ—*Lantana*, sp.—"Majorana." The leaves (? Rep.)

Lantana, sp.—"Sonorita." The leaves.

LABIATÆ—*Marrubium vulgare*, L.—"Marrubio." The leaves.

SOLANACEÆ—*Datura tatula*, L.—"Toloachi." The leaves and seeds.

BIGNONIACEÆ—*Pithecoctenium*, sp.—"Bejuco de Huico." The seeds.

COMPOSITÆ—*Hieracium*, sp.—"Lechuguilla." The green plant.

Piqueria trinervia, Cav.?—"Tabardillo." The crushed leaves.

Tagetes lucida, Cav.—"Yerba nil." The entire plant.

Tinnia linearis, Benth.—"Yerba de Torro." The stems.

—Pharm. Rev., Feb. 1900, 60–61.

West African Drugs—Description of New Sorts.—J. Slinger Ward calls attention to a number of drugs sent by an inhabitant of Sierra Leone, Mr. Onacoe Amnah, to London, together with a description of their uses by the natives of the Gold Coast. The present account is incomplete so far as the identification of the various drugs is concerned, on which point further information is promised. These drugs can only be briefly mentioned here by their native names:

Akotompoteng is a root, probably a species of *xylopia*, and certainly from a plant belonging to the anonaceæ. It is an astringent and styptic of great power, and certain in activity. It will check bleeding when other remedies fail; it is a native specific for piles, and is useful in menorrhagia, hæmaturia, hæmatemesis and hæmoptysis.

Toantin is a root which, as well as the leaves of the as yet unidentified plant, is very useful in disorders of the bowels and in diarrhœa, and as a tonic for both men and women. It is probably identical with the drug called "Tumardiahbah," which it much resembles.

Ekum-Nkura, meaning "killing mice," is the name applied to a bark which is probably derived from a *Bauhinia*, N. O. leguminosæ. As in-

dicated by its name, it is used as a poison for mice. Medicinally it is used in powder, mixed with water, as an application to reduce swellings, and also in the dry state as a sneezing powder. While not known to kill human beings, it "makes them dull."

Nkokobesah, or *Inconchery*, is an unidentified root, having a nice odor, and is sometimes used to cover the smell of fish and meats in soups. Medicinally it is used for a variety of purposes, as a tonic, "pain in the waist," as a "cure for weakness," etc.

Adesekanchie, the name applied to both the bark and the root of *Sarcocephalus esculentus*, N. O. Cinchonaceæ, is serviceable in many diseases. It is especially good for women during pregnancy, and used for stomach ache, waist pain, looseness of the bowels, etc. The drug has hitherto been imported under the name of "peach root," and has been described as an astringent and febrifuge capable of replacing cinchona bark.

Yarney Crop, the tops of a species of *Gladiolus*, probably *G. spicatus*, is used in the form of powder for a variety of purposes, in fact, is stated to be good in almost all diseases except dysentery and diarrhœa.

Atsunobie Bark, which has not been identified contains a peculiar form of tannin, and is used to check uterine hemorrhage. It is described as being a very powerful astringent.

Teyarebiasah, also an unidentified bark, is described as being useful in many diseases, particularly for consumption and cough. Finally,

Bongo is name given to the pod of *Cassia sieberiana*. The gum from the bark and pounded fruits, applied to open sores, is said to cure in a remarkable manner.—Pharm. Journ., March 17, 1900, 279–280.

Drugs — Causes of Commercial Scarcity. — Dr. E. M. Holmes makes some interesting observations concerning the causes that determine the scarcity of some drugs, at irregular intervals, in the European market. Primarily, this may be attributed to the keen competition in trade, which leads buyers to produce at as low a rate as possible; if then there are different grades or varieties of the same drug, ignorance of pharmacognosy asserts itself, and the genuine drug may go begging for a market while the substitute commands it. This is clearly exemplified in the case of

Jaborandi. Genuine leaves of *Pilocarpus jaborandi* are at present extremely scarce, while the Rio Janeiro drug (*Pilocarpus selloanus*) or the Maranham drug (*Pilocarpus microphyllus*) are abundant. The reason for this lies not in the fact that the genuine drug is not obtainable, but in that the demand of buyers is for the cheaper drug. The genuine and the Rio Janeiro kind are much alike in size and appearance; so when during a former scarcity large supplies of genuine jaborandi were shipped to Eng-

land, the genuine drug became "a drug on the market," because the inferior drugs were also in large supplies and very much cheaper.

Strophanthus is at the present time unobtainable of official (B. P.) quality and character. In this case the difficulty is due partly to the ignorance or carelessness of the first exporters and partly to their attempt to create a monopoly. The first exporters of the drug from Nyassa Land, thinking, apparently, that all strophanthus seed possessed the same properties, or finding only a limited amount of the genuine Kombe seed, adopted the practice of sending three varieties from three different species growing in different districts in the same country. Thus the seeds came to be exported mixed, and being much alike, the admixture became difficult to detect, though this can be done by chemical means, owing to the green color produced by the Kombe seeds with strong sulphuric acid, in distinction from the pink or reddish color produced by the seeds of *Strophanthus emini* and *S. courmontii*. Then, the attempt of the exporters to secure a monopoly by keeping botanists in ignorance of the exact plant, had for a natural result that the high price of the drug led to competition, and seeds of other species were imported from West Africa at a cheaper rate. Until some years ago German

Aconite Root formed the staple article of commerce. With the advent of Japanese aconite, carefully prepared, of good quality, but cheaper, the German drug, which was still the preferred, became lowered in price, was carelessly collected and prepared for the market. This caused the rejection of both by the B. P., and the adoption of aconite root cultivated in England and collected when at its best. But here also the competition of the German and Japanese drugs comes in, and their low prices are utilized to lessen the price of the English grown article. In the case of

Pareira Brava, the stems and roots bearing so close a resemblance, the genuine drug has been known to be rejected because of the uncertainty of the wholesaler as to its genuine character. Hence the genuine drug is often sold at a loss to the shipper, and in consequence becomes scarce and dear subsequently. The cause of the inferior quality of

Scammony is in reality the demand in certain markets for an inferior article. Thus, Skilip scammony, containing only about 40 per cent. of resin, and worth barely half the price of the pure drug, is largely in demand in the South American market, where buyers will not pay the price of the pure drug. With

Saffron, the demand for a cheap article also leads to the prevalence of inferior qualities, there being a regular supply of inferior (Alicante) saffron at a shilling per ounce less than the Valencia saffron.

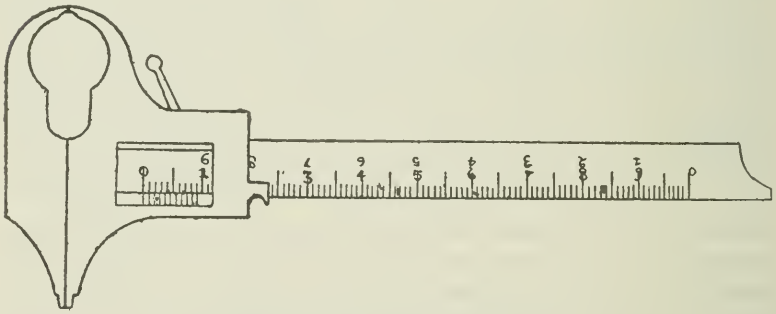
Summing up, Dr. Holmes observes that the wholesale dealer in drugs has to supply the varying demands of different countries, and must either lose business or keep in stock and sell drugs of varying qualities. But he

is always willing to procure drugs of the best quality for those who will pay the price for them. Unfortunately, the retailer has often the knowledge derived from text-books, and very little practical knowledge of commerce. Few, probably, could pass a successful examination if asked questions as to the different grades of drugs in wholesale price-lists and their relative values for purposes of pharmacy.—Pharm. Journ., March 17, 1900, 278–279.

Kneipp Remedies—Classified List.—Cæsar & Loretz have recently brought out a list of vegetable drugs used by Rev. Father Kneipp in his practice. Inasmuch as "Pfarrer Kneipp," as he is known among German-speaking people, has many followers in the United States, the "Pharm. Review" (Dec. 1899, 565–567) reproduces this list, which may prove serviceable to American pharmacists who have among their customers believers in the Kneipp school of therapeutics.

Vegetable Drugs of the U. S. P.—Inaccuracy of Definition of Measurements.—Prof. L. E. Sayre calls attention to the inaccuracy in the official definition of measurements of roots, rhizomes and other vegetable drugs, and publishes a long list of such drugs, in which the official description is

FIG. 58.



Calipers for Measuring Roots.

compared with actual measurements of roots and rhizomes from stock. For this purpose he employed the calipers shown by Fig. 58, which is now on the market and admirably adapted for such use. This convenient instrument has a scale and a vernier reading to tenths of a millimeter between 0 and 10 centimeters. On one side the jaws extend out straight from the central scale bar for the measurement of the uniformly curved surfaces, while on the other they are hollowed out so as to permit their extension over irregularities. A small lever sets the vernier at any point and renders movement of the parts impossible after the measurement has been taken. The following examples may show how great the variation of the official description may be from actual measurements:

Apocynum —	U. S. P.:	From	5	Mm.	to	15	Mm.	Stock:	From	1	Mm	to	12.3	Mm.
Belladonna—	"	About	10	"	"	25	"	"	"	3.5	"	"	19	"
Cimicifuga —	"	"	25	"				"	"	5.1	"	"	14.3	"
Gentian—	"	"	25	"				"	"	3.1	"	"	9.5	"

The stock represented fair average samples of the commercial drugs.—Drugg. Circ., April, 1900, 68.

Vegetable Drugs—Standardization.—Burt E. Nelson discusses the question of providing alkaloidal standards for at least the more important of our vegetable drugs in the next revision of the U. S. P. He observes that it is true that many of the objections to such a move which were recognized by the members of the convention at Washington ten years ago, still exist, but it is equally true that the advances along these lines since that time have been sufficient to warrant a more extensive recognition of their importance. Among the more recent of these might be mentioned the work of Tschirch in showing that a number of our most laxative and cathartic drugs owe a large part of their activity to oxymethylanthraquinone, of Jacobi on ergot, and among American workers the process of Prescott and Gordin for assaying opium volumetrically by means of decinormal iodine solution, of Prescott and Hess for separating coumarin and vanillin, and the discovery of cocainidine by Dr. Shaefer; and the data collected by the numerous analysts connected with our manfacturing plants. The author, furthermore, points out that drugs vary very greatly in their strength, and that, therefore, to make preparations of definite strength from these drugs it is necessary to adopt some standard of alkaloidal content for each, and then to use a proportionally larger or smaller amount of the crude drug; for example, if 0.350 per cent. of atropine be adopted for belladonna leaves and the sample on hand be found to contain but 0.250 per cent. our calculation would simply be as follows: as 0.250 per cent. is to 0.350 per cent. so is 150 grams to x (210 grams), the amount required for preparing extract of belladonna of the standard strength. At present the figures adopted by manufacturing houses are principally the results of their personal experiences, and frequently differ. In hospital work the author has used for some time those given in the list which follows, which differ but little from those of a well-known manufacturing house, and which he has found to represent the average content of good samples of the drugs, but not the average content of the drugs as they frequently occur in small quantities on the market for the past several years.

Powdered opium; 15 per cent. of morphine.

Nux vomica; 1.5 per cent. of total alkaloids.

Cinchona; 5 per cent. of total alkaloids.

Hyoscyamus; 0.150 per cent. of alkaloid, calculated as $C_{17}H_{23}NO_3$.

Belladonna leaves, 0.350 per cent. of alkaloid, calculated as $C_{17}H_{23}NO_3$.

Belladonna root, 0.450 per cent. of alkaloid, calculated as $C_{17}H_{23}NO_3$.

Stramonium leaves, 0.375 per cent. of alkaloid, calculated as $C_{17}H_{23}NO_3$.
Aconite root, 0.500 per cent. of alkaloid (physiological test 1 to 600).
Coca leaves, 0.500 per cent. of alkaloid, calculated as $C_{17}H_{21}NO_4$.
Colchicum seed and root, 0.500 per cent. of total alkaloids.
Sanguinaria root, 1.000 per cent. of total alkaloids.
Kola, 2.000 per cent. of caffeine.
Guarana, 3.000 per cent. of caffeine.
Hydrastis, 2.000 per cent. of hydrastine.
Ipecac, 1.750 per cent. of total alkaloids.
Gelsemium (little used), 0.350 per cent. of total alkaloids.
Pilocarpus (little used), 0.350 per cent. of total alkaloids.
Veratrum viride (little used), 1.000 per cent of total alkaloids.

Digitalis, strophanthus and a number of others are regularly assayed, but no attempt is as yet made to standardize the preparations made from them.— Drugg. Circ., Aug. 1899, 173–174.

Powdered Drugs—Cause of Different Percentages of Ash in Fine and Coarse Powders.—Referring to the recent observation of Dietrich that the amount of ash yielded by the fine and coarse parts of certain drugs varies with the fineness of the powder (see Proceedings 1899, 495), Melvin William Bamford observes that, while Dietrich simply proves a certain difference in ash, he fails to assign any special cause for it. In order to be clear on this and other points, the author has made a series of experiments with senna and with ipecac. In the case of senna the results showed but a slight increase with the fineness of the powder. Then the No. 8 powder yielded 10.17–10.20 per cent., the No. 30, 10.64–10.96 per cent., and the No. 80, 10.90–10.96 per cent., these results being doubtless due to the fact that in senna leaves the tissues could not be separated in the powders of different degrees of fineness. In the case of ipecac, however, which was selected for the reason that the tissues could easily be separated by the two kinds of powder, the results were very different. The cuticle portion yielded from 2.44 to 2.45 per cent. of ash, while the woody portion yielded from 1.47 to 1.69 per cent. When the entire drug was powdered, the coarse (less than No. 20) powder yielded only from 1.90 to 2.14 per cent., whilst the No. 80 powder yielded from 12.35 to 12.54 per cent. of ash. The solution of this apparent anomaly is quite simple. It was revealed under the microscope that a considerable quantity of sand adhered to the cortical portion. Naturally, when the drug was powdered these particles of sand and other foreign matter were separated and passed through the sieve with the finest part of the powder, and hence the high percentage in the fine powder.— Amer. Jour. Pharm., Nov. 1899, 511–513.

Powdered Drugs—Commercial Quality—W. B. Webster has examined 78 samples of powdered drugs, representing 16 different sorts, viz., allspice, caraway, cassia cinnamon, cayenne Ceylon cinnamon, cloves, ginger, ipecac,

kamala, licorice, lupulin, lycopodium, mustard, nux vomica, pepper, rhubarb and turmeric. He found 44 of these samples largely or grossly adulterated; 4 were moderately adulterated or partly exhausted; the remaining 30 were genuine and of fair to good quality.—Proc. Maine Pharm. Assoc., 1899, 40–41.

Drug Adulterations—Change in Methods.—Ed. Huber observes that, judging from observations made during the past few years, adulteration of drugs and foods is on the decrease in our country. This fact is due primarily to the enforcement of the food and drug laws in several of the States. Until recently, the chief adulterant has been starchy material, in the form of flour, ground corn, etc., and inorganic substances, such as terra alba and gypsum. But the necessity of more thoroughly masking adulteration has caused these adulterants to be largely substituted by inert organic material containing no starch, and consequently less liable to detection, usually some closely related, cheaper substance, as, for instance, pyrethrum stalks in the powdered flowers, etc. The author mentions the nature of the adulterants and the conditions in which he found samples of the following drugs obtained from three different localities: golden seal, rhubarb, licorice root, bloodroot and asafetida.—Proc. Wisc. Pharm. Assoc., 1899, 35–36.

Seeds—Effect of Heat on their Powers of Germination.—Doyére has shown that grains of wheat may be heated to 100° C. without affecting their powers of germination, if they have previously been dried *in vacuo*. V. Jodin now finds that the same results may be obtained with certain seeds without employing a vacuum, if the temperature be regulated so that they are thoroughly deprived of moisture before being exposed to a greater heat. Thus the seeds of *Lepidium latifolium* and peas, heated at once to 98° C. for ten hours were all killed; but if first exposed for twenty-four hours to a temperature of 60° C., then for ten hours to 98° C., 30 per cent. of the peas and 60 per cent. of the Lepidium seeds germinated. In fact, a temperature of 60° C. appears to be quite harmless to these particular seeds. This is only the case, however, if the seeds are exposed in an open vessel, so as to permit the rapid elimination of hygrometric moisture. If this be checked, the vitality of the seeds is at once impaired. If they are heated in sealed tubes, or even in tubes with an open capillary aperture, they are killed even at 40° C. But if a hygroscopic body, such as quicklime, be previously introduced into the same tubes, so as rapidly to absorb the moisture given off, the seeds remain as resistant to the effects of heat as those treated in an open vessel.—Pharm. Journ., Jan. 20, 1900, 41, from Comp. rend., *129*, 893.

Seed Germination.—Resistance to the temperature of *Liquid Hydrogen*, which see under "Inorganic Chemistry."

ALGÆ.

Chondrus, U. S. P.—Botanical Source, Collection, etc.—Professor Henry Kraemer very interestingly describes the methods pursued on the Massachusetts coast in the collection of Irish moss as witnessed by him at Scituate, which appears to be a particularly favorable situation. The season for collection begins late in May and continues to September, June and July being the best months. The moss at the present day is only found on rocks that are from 15 to 20 feet below the tide, hence women no longer engage in its collection. The men go out in their sail boats or dories at half tide, and come in at half flood. With their long rakes they scrape the moss off the rocks, collecting thus about 50 pounds to the boat, the total for the season at Scituate being about 10,000 pounds. The moss is spread out on the high beach for a week or so, the action of the sun and dew bleaching it. It is then enclosed in hogsheads, in which it is again saturated with sea water by rolling them in the marshes; after which it is again spread out and subjected to the bleaching process, this alternate treatment being repeated four or five times, until the product is of a yellowish or white color. The final drying is done in barns, where the moss is stored until it is packed in 100 lb. barrels at the end of the season. The author in the course of his journey had opportunity to observe the *Chondrus* growing and gathered in different localities along the coast, and found it to consist chiefly, if not entirely, of *Chondrus crispus*. While it is stated in Dr. Farlin's "The Marine Algæ of New England" that the closely resembling *Gigartina mamillosa* is common from Boston northward, Prof. Kraemer is inclined to believe that *Chondrus crispus* (L.) Stack., is practically the only source of the American drug, and that therefore the U. S. P. definition of botanical source must be modified in this respect.—Proc. Penn. Pharm. Assoc., 1899, 113–116.

BACILLARIÆ.

Tubercle Bacillus — Chemical Composition. — Drs. de Schweinitz and Dorset have determined some of the chemical components of the tubercle bacillus. They find that cellulose in very minute amount is present in bacilli grown upon different culture media. It is probable, therefore, that cellulose is a normal constituent. The amount of fat in the bacillus is very large, being equal to about 37 per cent. of the weight of the dried germs. The fat is principally a glyceride of palmitic acid. Other fats are present in small quantities. One of these, which is volatile, gives to tuberculous cultures their characteristic odor. The large percentage of fat in the tubercle bacillus suggested the use as a staining reagent of Sudan III., which is a useful stain for fats in histological and pathological work. The result was very satisfactory, and apparently this stain is more selective than carbol-fuchsine. Smegma bacilli, which stain readily with fuchsine, do not stain with Sudan III. The mineral constituents of the

tubercle bacillus include sodium, potassium, calcium and magnesium. The high percentage of phosphorus pentoxide and the absence of other acid radicals were noticeable.—Pharm. Journ., March 31, 1900, 333, from Brit. Med. Journ., 2047, 745.

Gonococcus — New Stains. — Attention is directed in "Inter. Med. Mag." (*9*, 53), to the following new stains for gonococcus, which should be prepared fresh as needed:

Pick's Stain consists of Liehl's carbol-fuchsine, 15 drops; concentrated alcoholic solution of methyl blue, 8 drops; distilled water, 20 Cc. Stain cold for ten seconds, wash, dry and mount. The gonococcus is stained deep blue, other bacteria light blue, cell nuclei lighter blue, protoplasm pink.

Lanz's Stain consists of saturated solution of fuchsine in 2 per cent. aqueous phenol, 10 Cc.; saturated solution of thionin in 2 per cent. aqueous phenol, 30 Cc. Mix, stain for fifteen to thirty seconds, and wash with water. Gonococci are stained by thionin, and nuclei take both colors.—Pharm. Journ., April 7, 1900, 357.

Bacteria—Non-Impairment of Vitality After Exposure to the Temperature of Liquid Air. — Dr. A. McFadyen has kept bacteria at a temperature of —190° C. for twenty-four hours without their vital powers being affected. The organism, with which he experimented possessed varying degrees of resistance to external agents—the extremes being represented by the very sensitive spirillum of cholera asiatica, and the highly resistant spores of the anthrax bacillus. Pure cultures were taken of *Bacillus typhosus, B. coli communis, B. diphtheriæ, S. choleræ asiaticæ, B. proteus vulgaris, B. acidi lactici, B. anthracis* (sporing culture), *Staphylococcus pyogenes aureus, B. phosphorescens*, and *Photobacterium balticum*. They were simultaneously exposed to the temperature of liquid air (—182° C. to —190° C.) for twenty hours, then carefully thawed and examined. In no instance could any impairment of vitality be detected, the fresh growths obtained being normal in every respect, and the functional activities of the bacteria quite unaffected. Experiments with representative types of organisms usually met with in the air—moulds, bacilli, cocci, torulæ and sarcinæ—had similar results, whilst a sample of yeast cell plasma (Buchner's zymase) retained its peculiar properties unchanged as regards the production of carbon dioxide and alcohol, after twenty hours' exposure to the intense cold mentioned. — Pharm. Journ., March 31, 1900; from Lancet, *3995*, 849.

Bacterium—Occurrence on Sugar Cane.—In 1897 H. Marshall Ward called attention in "Annals of Botany" to a curious association of organisms in an excrescence on sugar cane, said to have come from Madagascar, these organisms consisting of a *bacterium* associated with at least one yeast, which is probably a variety of *saccharomyces cerevisiæ*. The or

ganisms grew together in saccharine solutions, producing clumps very like the ginger-beer plant, and have now been subjects of investigation by the author in conjunction with J. Reynolds Green. These clumps induce a powerful fermentation in 14 to 20 per cent. aqueous solution of common brown sugar, resulting in the liberation of carbon dioxide and the production of some acid, the saccharine liquid being then converted into a not unpleasant acid drink, with some resemblance to lemonade or ginger beer. The experiments show that in the association of organisms there is an agent capable of setting up active fermentation in various saccharine liquids, the fermentation resulting in the destruction of the sugar and production of carbon dioxide, and being anaërobic. Plate cultures of the bacterium were obtained as circular, raised, dome-shaped, watery-looking colonies, stiff, like a firm jelly. The behavior of the organism was tried in all the various media known to bacteriologists. It is a striking fact that this schizomycete practically refuses to grow in or on any pabulum devoid of sugar, and, further, that only certain sugars are capable of supplying it with the necessary food.—Pharm. Journ., July 1, 1899, 1; from Proc. Royal Soc., *65*, 65.

FUNGI.

Fungi—Resistance to the Action of Acids.—According to J. F. Clark, fungi are in general much more resistant to most deleterious agents than are the higher plants. In the case of mineral acids, a concentration of from 200 to 400 times the strength fatal to the higher plants is required to prevent the germination of mould-spores under otherwise favorable conditions. Different kinds of fungi exhibit very great differences in their power of resistance to different agents. Even spores taken from the same culture may differ from one another in this respect. Hydrocyanic acid is a violent poison to moulds, while strychnine is nearly innocuous.—Pharm. Journ., May 26, 1900, 569; from Bot. Gazette, 1889, 289, 378.

Yeast—Biology.—Professor J. Reynolds Green delivered a lecture before the Pharmaceutical Society of Great Britain which deserves more than passing notice, since it clearly presents the essential knowledge on the biology of yeast from the earliest times, when the Dutch naturalist, Leuwenhock, in 1680, discovered that the scum which was associated with the process of fermentation had an organized structure and consisted of a certain number of small globules. Prof. Green's lecture being in itself a condensed review of his subject, its full value can be appreciated only by reference to the original report, but a brief synopsis may find place here with advantage. After lying dormant, so to speak, for a long period, during which the globules were considered to be of animal origin, yeast was recognized, about 1820, by three different observers to be a vegetable organism, while the most important contribution to their knowledge and to a general knowledge of the industries which depended

upon the work of yeast was due to a fourth one, Dr. Emil Hansen, of Copenhagen, whose researches are unfortunately for English-speaking people buried in the literature of a foreign language. The chemical aspect of fermentation had been taken up by Lavoisier towards the end of the last century, one of his great discoveries, based upon accurate chemical analysis, being that sugar is split up by the fermentive action of yeast into carbon dioxide and alcohol, and, as he believed, in absolute and final molecular proportions. Further light was thrown upon the slight discrepancies arising from this assumption by the discovery by Dubrunfant, about 1847, that cane sugar had to be converted into uncrystallizable sugar before it would ferment; and it was subsequently found that by the action of acids cane sugar was split into two other sugars, namely, glucose and fructose, known more modernly as dextrose and lævulose. What may be called the first discovery of a purely biological nature was made by Berthelot in 1860, when he announced the presence of enzyme, now called *invertase*, the function of which was to split the cane sugar molecule, under the assimilation of a molecule of water, into the two sugars mentioned; thus explaining scientifically the discrepancy which existed between Lavoisier's theory and the actual experiment. A second enzyme, which is concerned in the splitting up of malt sugar into dextrose and glucose, was discussed in 1883 by Bourguelot, and called *maltase*. The question then came: "What did the yeast do to the sugars produced by these enzymes?" "What was the relation between the yeast itself and the sugary liquids?" and "What the life process in the yeast of which this curious fermentation gave the expression?" A strong controversy was indulged in by eminent chemists on the Continent, the most pronounced view in connection with the study of the biology of yeast being that held by Pasteur, who discovered that the action of yeast was very much more energetic in the absence of oxygen. On this he formulated his theory that "the fermentation was an expression of the organism to obtain energy in the absence of oxygen," and held that 96 per cent. of the sugar subjected to the action of yeast went to alcohol and carbon dioxide, while 4 per cent. went into succinic acid and glycerin. The most earnest of his critics, however, Schützenberger, observed that if Pasteur's theory was true, it is very evident that fermentation ought not to go on in the presence of oxygen, while the contrary is a fact, since fermentation is much more energetic in the presence of oxygen than in its absence; and while this is a difficulty that might be got over, Schützenberger explained that instead of fermentation being for the purpose of producing energy, it was for the purpose of supplying nutriment — an alimentary process, and not a respiratory one. Moreover, the curious fact was ascertained that in a liquid containing organic nitrogen in solution — peptones or amides — the yeast will produce alcohol without any sugar being present at all, and this led to the discovery of a third enzyme in yeast, namely

diastase, which has the power of saccharifying the carbohydrates of the $C_6H_{10}O_5$ group to which the starch-like body glycogen, enclosed in the yeast cells, belongs. Two theories having thus been advanced, the alimentary and the respiratory, much might be and has been said to reconcile them and to explain the divergencies between the two views. But there were many other problems to be solved, not the least of which was "whether or not the yeast-cell secreted an enzyme which was directly concerned in doing the great work of forming alcohol," and it was not until very recently, in 1896, that this problem was also solved by the discovery of Büchner that there was in yeast an enzyme which had the power of carrying this out. This enzyme he called *zymase*. After many efforts to isolate this, he finally adopted a very drastic method. The yeast was dried, powdered, mixed with kieselguhr (or dynamite earth), and then ground in an agate mortar to impalpability: the argument being that you must completely deorganize and crush the cell so as to destroy it entirely, and that then perhaps the protoplasm would give up what it held so fast. The disintegrated yeast was then extracted, and as a final stage, subjected to the enormous hydraulic pressure of about five tons to the square inch. It was found that this extract was capable of being filtered clear, forming an almost translucent yellow, viscid liquid, having a very yeasty smell. When boiled (*sic*) it deposited a marked coagulum of proteid character at a temperature of 45° to 50° C., a very low temperature indeed for coagulation. When it (the zymase before coagulation? Rep.) was placed in a solution of cane sugar—the best strength he found to be 10 per cent.—there was almost at once a very vigorous fermentation set up, and even at the ordinary temperature of the laboratory there was frothing on the top of the liquid. The immense pressure to which this enzyme was subjected in the course of its preparation alone precluded the possibility of the presence of a living organism in it, and this was further confirmed by the fact that it retained its activity unimpaired in the presence of chloroform. It was also found that the enzyme could be reduced to dryness by desiccation without losing its activity. Containing a great deal of proteid matter, the solution as prepared by Büchner rapidly underwent change, and the activity of the enzyme was very difficult to maintain—destroying itself in a day or two, or perhaps a week, according to its condition. The enzymic power had disappeared, together with the proteid matter coagulable at 45° to 50° C., but it did contain something it had not before, namely, a great quantity of crystals of tyrosin, one of the bodies which is produced from the action of the pancreatic juice on the proteids. This disappearance of the proteids and appearance of tyrosin suggested that yeast contained still another enzyme (allied to the *pancreatic ferment?* Rep.), and this was looked for, and in due course it was found.—Pharm. Journ., Nov. 18, 1899, 475–478.

Ergot—Active Constituents.—In a prize essay recently communicated

to the "Pharm. Weekbl." (*39*, No. 17 to 23), J. S. Meulenhoff arrives at conclusions concerning the chemical constituents of ergot which are in some respects remarkably at variance with those hitherto reported. He regards the active constituents of ergot to be *sphacelinic acid* and a body, not present in all sorts of ergot, possessing spasmodic action. Aqueous extractions of ergot are regarded as being unsuitable preparations, because of the insolubility of sphacelinic acid in water. Ergot contains a single alkaloid, *ergotinine*, which determines its activity only in a moderate degree, but which is not appreciably decomposed during the storage of the drug. Tanret's method of preparation does not yield pure ergotinine. Neither *ecboline* nor *ergotine* can be regarded as distinct bases, while *cornutine* is regarded as a decomposition product of ergotinine by the action of acids, Kobert's cornutine depending on its activity in all probability by containing some of the before-mentioned body possessing spasmodic action in admixture. Finally, *ergotinic acid* must probably be regarded to be a gum- or dextrin-like carbohydrate.—Pharm. Centralh., Oct. 26, 1899, 656.

Ergot—Percentage of Cornutine a Basis for Standardization.—Cæsar & Loretz (Geschäftsbericht, Sept. 1899) publish a series of valuations of ergot which show that it will not be difficult to meet the minimum requirement of 0.15 per cent. of cornutine proposed by the Revision Commission of the German Pharmacopœia. Nine lots of good quality of ergot yielded from 0.190 to 0.350 (average 0.240) per cent. of cornutine by Keller's process, while three poor grades assayed respectively 0.078, 0.157 and 0.157 per cent.—Pharm. Review, Nov. 1899, 522.

Ergot—Preservation by Formaldehyde. — Pées recommends formaldehyde for the preservation of ergot. Granulated potassium sulphate is saturated with formaldehyde in a tube, which is suspended in the bottle containing the ergot. The formaldehyde must be renewed from time to time according to the frequency with which the container is opened. — Pharm. Post, June 25, 1899, 358; from Jour. de Pharm.

Ergot of Wild Rice — Description. — The occurrence of *claviceps purpurea*, Tulasne, upon the wild rice, *Zizania aquatica*, L., as a host plant has not been mentioned by Saccardo in his "Sylloge Fungorum." R. H. Denniston has now had opportunity to examine a specimen of wild rice, obtained by A. E. Jenks from the Diba Indians of northern Wisconsin, in which a number of ergot grains were found, having the appearance shown in the upper row of the accompanying cut (Fig. 59), the two objects beneath being grains of wild rice. The ergot grains are called by the Indians "frozen kernels," and are similar to the official ergot in color and odor, but differ in size and shape as shown. They are externally of a dark purplish color, internally pinkish or light purple, vary in length from 5 to 15 Mm., and in thickness from 3 to 6 Mm., and, on a cross section,

exhibit a mass of hyphal elements. It would be interesting to determine the comparative active contents of this and official ergot. Pharm. Rev., March, 1900, 118.

FIG. 59.

Ergot Grains of Wild Rice.

Onygena equina, Willd.—A Horn-Destroying Fungus.—According to the investigations of H. Marshall Ward, there are a half-dozen species of fungi of the genus *Onygena*, remarkable for their growth on feathers, horns and hoofs of cattle. From the material yielded by a cow's horn thoroughly infested with the mycelium of one species, *Onygena equina*, Willd., he has cultivated this fungus, and has fully investigated its life-history, structure, and development. It is an ascomycete, and the ascopores require digesting in the gastric juice. Hence, in nature, they have to pass through the stomach of the animal. By using artificial gastric juice, and employing glue and other products of hydrolysis of horn, the details of germination and growth into mycelia were traced step by step. It is evident that as the spores of *Onygena* pass through the body of the animal an extract of the dung affords a suitable food medium to again start the growth on horn. The cattle probably lick the *Onygena* spores from their own or each other's hides, hoofs, horns, etc.—Pharm. Journ., July 22, 1899, 65; from Proc. Roy. Soc., *65*, 158.

Amanita Muscaria—Coloring Matters.—According to A. B. Griffiths, *Amanita muscaria* contains two coloring matters, the one green and amorphous, the other red. The green coloring matter has the composition $C_{29}H_{20}O_{10}$, and affords characteristic spectroscopic absorption bands. It is extracted with chloroform-ether, and purified after the evaporation of the solvent, by several successive solutions in chloroform. The red pigment has the composition $C_{19}H_{18}O_6$.—Pharm. Journ., Feb. 10, 1900, 115; from Compt. rend., *130*, 42.

Pleurotus Olearius—Question of Toxity.—Professor G. Arcangeli states that *Pleurotus olearius*, alleged to be a poisonous fungus, is greedily eaten by the larvæ of some insects, and by snails, without appearing to do them any harm. Although rabbits in their wild state refuse it, it does not appear to have any specially injurious effect on them in small quantities. It, however, acts as an emetic on dogs, as it does with man.—Pharm. Journ., April 14, 1900, 389; from Atti. Soc. Tuscana Sci. Nat., 1900, 22.

Edible Mushrooms—Utilization and Precaution in their Use.—Prof. R. Kobert communicates some interesting observations on the economic uses of edible mushrooms. They constitute not alone a valuable food material on account of their nutrient properties, but are valuable adjuncts to the foods for the sick on account of their pleasant flavor, which makes them more acceptable than other foods or corrects the taste of those less acceptable. A pleasant preparation for the sick or convalescent is obtained by subjecting fresh sound mushrooms to strong expression, macerating the press cake in alcohol of 45 per cent. during 24 hours, and again expressing. The expressed juice should immediately be heated to boiling and preserved on ice until the alcoholic extraction is finished. Then, having united the two liquids, they are filtered and concentrated cautiously so as to remove the greater part of the alcohol. When mushrooms are to be eaten in substance, they should be carefully selected and freed from such as have become partly decayed or wormy. They must be well masticated even by persons who have sound digestive organs, and for invalids should be finely chopped or even pulverized before cooking, They should never be eaten in the raw state, since some varieties, while harmless after cooking, are more or less poisonous in the raw condition. After cooking, mushrooms should be consumed on the same day. If kept over night certain changes may occur, such as the conversion of the choline, which all edible fungi contain, into the poisonous neurine. The domestic methods of distinguishing between poisonous and edible mushrooms, such as the blackening of a bright silver spoon, the blueing of a fresh cut surface of the fungus, are worthless. Recognition by others than experts is possible only by the aid of good colored illustrations of both edible mushrooms and of the poisonous mushrooms resembling them.—Apoth. Ztg., Aug. 12, 1899, 482.

FILICES.

Male Fern—Influence of Soil and Climate.—Cæsar & Loretz (Geschäftbericht, Sept. 1899) confirm the observations heretofore made (see Proceedings, 1898) that soil and climate have a greater influence upon the content of filicic acid in male fern than has the time of collection. Soil of volcanic origin produces the richest varieties, a schistic soil being the next best. While the better varieties of rhizomes contained from 5.80 to 9.57 per cent. of filicic acid and from 19.20 to 31.29 per cent. of impure filicin, a rhizome collected in the Black Forest in the fall contained but 10.45 per cent. of impure filicin and gave no reaction for filicic acid. —Pharm. Review, Nov. 1899, 521.

GRAMINACEÆ.

Bamboo—Manna-like Exudation on Stems Growing in India.—David Hooper calls attention to the recent occurrence of a sweet secretion on the stems of bamboos growing in the bamboo forests of Chanda, in the central provinces of India. These forests consist of

Dendrocalamus strictus, the male bamboo, a bushy plant from 20 to 30 feet in height, and affecting the cooler northerly and westerly slopes of Central and Southern India; and it is said to be the first time in the history of these forests that a sweet and gummy substance has been known to exude from the trees. The occurrence of a manna-like exudation in the culeus of the bamboo, hitherto regarded as dry and barren, is the more remarkable in view of the fact that at this time of great scarcity it should afford sustenanee for a famine-stricken people. An authentic specimen, received by the author from Dr. Watt, Reporter on Economic Products, Calcutta, occurred in short stalactiform rods about an inch long, white or light brown in color, more or less cylindrical in shape, but flattened or ground on one side, where the tear had adhered to the stem. It was pleasantly sweet, without the peculiar mawkish taste of Sicilian (*Fraxinus*) manna, and the solution, when allowed to repose, deposited white, transparent crystals of sugar. It contained 2.66 per cent. of moisture, 0.96 per cent. of ash, 0.75 per cent. of a substance reducing Fehling's solution, and a small quantity of nitrogenous matter, *but no mannite*, the remainder of the substance being evidently cane sugar. Although bamboo manna has been mentioned and described by Dioscorides, this was apparently not known as an exudation, but consisted of the sugary pith of the bamboo stems, known to Europeans by the name of "tabâshir," and consisting largely (up to 80 per cent.) of pure silica. This substance has been described by Sir David Brewster, Dr. F. A. Flückiger and others; but the occurrence of a manna-like exudation on the outside of the stems of bamboo has, on so recent an authority as that of Dr. Watt, never been recorded by Indian travelers. – Pharm. Journ., June 16, 1900, 640.

LILIACEÆ.

Aloes—Reactions of Different Sorts.—Karl Heuberger has applied the numerous reactions that have been proposed during the past 20 years for the identification of the different sorts of aloes, embracing in his investigations Curaçao, Barbadoes, Socotra lucida, Socotra liquida, Moscha, Uganda, Zanzibar, old and new Cape and Natal aloes, together with pure aloins, emodins, etc. His investigations prove the absence of a single reaction that holds good for all sorts of aloes, this being due to the distinct composition of nataloin from the other aloins, yielding, for instance, neither oxymethylanthraquinone nor chrysophanic acid. The reactions most available for distinguishing between the different sorts are the halogenid and the cyanogen reactions of Klunge. For this purpose, 0.5 Gm. of the sample is boiled with 50 Cc. of water, the solution filtered and diluted to 500 Cc. For the

Halogenid Reaction, 1 Cc. of solution of cupric sulphate (1 : 20) is added to 10 Cc. of the aloes solution, followed by 0.5 to 1 Cc. of sodium chloride solution (1 : 3) and 1 to 2 Cc. of alcohol; or, omitting the alcohol, applying a gentle heat. The

Cyanogen Reaction is made by adding 1 Cc. of the copper sulphate solution to 10 Cc. of the aloes solution, and then 1 Cc. of cherry-laurel water. The results obtained with the different sorts of aloes are exhibited in the following:

Variety of Aloes.	Halogenid reaction.	Cyanogen reaction.
Curaçao. ...	Red in the cold, deep cherry red on heating	Intense rose-red with a violet tinge.
Barbadoes ...	Red in the cold, deep cherry red on heating	Intense rose-red with a violet tinge.
Moscha	Somewhat reddish	Colorless.
Uganda	Colorless	Very faint rose-red.
Socotra liquida .	Colorless	Colorless.
Socotra lucida ..	Colorless	Colorless.
Zanzibar	Colorless	Colorless.
Cape, new	Yellowish with a tinge of red	Colorless.
Cape, old	Colorless	Colorless.
Natal, new	Faint rose red after 5 minutes	Colorless.
Natal, old.... .	Faint rose-red after 5 minutes	Colorless.

The sorts of aloes now found in commerce may also be distinguished by Borntraeger's ammonia test, particularly if applied in connection with ether as proposed by Tschirsch. The reactions are as follows:

Variety of Aloes.	Color of the Ammonia.	Color of the Supernatant Ether.
Barbadoes	Dark cherry-red	Yellow.
Cape	Orange, then red	Colorless.
Natal	Yellow	Red.

—Schweiz. Wochenschr. f. Ch. u. Ph. 1899, 506.

Sanseveria Ehrenbergii—A New Source of Cordage Fibre.—According to a recent British Consular Report, a species of aloe, *Sanseveria Ehrenbergii*, which grows in profusion over many parts of the Somali Coast, produces a fibre that is used all over the country by the natives to manufacture the ropes they require for leading their camels. The qualities of the fibre have attracted attention, and it is stated that a British firm has taken the matter in hand, there being every hope that a new industry will be developed.—Pharm. Journ., March 10, 1900, 254.

Convallaria Majalis—Relative Strength of the Root and Flowers.—August Schrader reports the results of a series of experiments undertaken to establish the relative value of lily of the valley root and of the flowers

with stems, which indicates that the root contains about three times as much of the bitter active principle as the flowers and stems.—Proc. Maryland Pharm. Assoc., 1899, 128.

Yucca Filamentosa—Proximate Examination of the Rhizome.—Max Morris has made a proximate examination of the fresh rhizome of *Yucca filamentosa*, a plant that grows profusely in the poorest soils, and well known in the Southern States by various names, as Adam's Needle, Silk Grass, Eve's Thread, Bear Grass, the latter name being the most common. The fibre of the leaves is uncommonly strong and durable, and is used for a variety of purposes, while the rhizome has a reputation for rheumatism. The air-dry rhizome lost 6.12 per cent. of moisture on drying at 110° C., to constant weight, and left 5.79 per cent. of ash on incineration. It yielded to petroleum ether 0.360 per cent. of a light-colored resinous substance, containing 0.04 per cent. caoutchouc, 0.25 per cent. fats, and traces of wax. Followed by ether, 0.214 per cent. of extract, chiefly composed of resin, was obtained. Alcohol then extracted 5.146 per cent. of a reddish extract, the greater portion of which was soluble in cold water, and contained, among other constituents, saponin. The watery extraction yielded 4 per cent. of mucilage and albuminoids, 7.65 per cent. of glucose and 3.5 per cent. of saccharose, the total aqueous extract amounting to 33.68 per cent. It yielded 4.04 per cent. to dilute alkaline solution, to dilute hydrochloric acid 1 per cent. of calcium oxalate and phosphate, and 1.48 per cent. of other matters. It yielded finally 17.4 per cent. of lignin and cellulose. An estimation of the saponin was made, and determined to be 1.699 per cent.—Proc. Georgia Pharm. Assoc., 1899, 63–66.

IRIDEÆ.

Saffron—Culture and Adulteration in India.—A writer in "Indian Gardening" advocates the culture of saffron in India and condemns the notion that it cannot be grown successfully anywhere in India except in the Kashmir Valley. He points out a number of localities where the plant will thrive, and considers it important that it should be more generally cultivated, since saffron is used largely in India for cooking and flavoring purposes. The saffron commonly sold in the bazaars at a cheap rate is an article adulterated with safflower. At Delhi, false saffron is made in the following ingenious way: They take the thread-like roots of onions and wash them thoroughly with water. Afterwards they cut them into very small pieces, and color them with the flowers of the "sad tree," *Nyctanthes Arbor-tristis*, extracted by boiling the buds. After drying in the shade, this product is mixed with a little genuine saffron, with a view to scent the whole, and is put up in boxes for sale.—Drugg. Circ., April 1900, 77; from Brit. and Col. Drugg.

Crocus—Examination of Commercial Samples.—After giving a compre-

hensive description of *Crocus sativus*, L., and of its important organs, particularly of those concerned in distinguishing genuine saffron from its adulterants, William Stair Weakley communicates the results of an examination of twelve commercial specimens by the micro-chemical method of valuation, which, as suggested by Henry Kræmer, was carried out as follows: From six or eight different parts of the sample small portions (about 5 Gm.) of the drug were taken, mixed, and 100 pieces were then counted out at random, to be tested A suitable number of these pieces were then laid upon a slide, and sulphuric acid, C. P., added, those giving the blue color reaction characteristic of true saffron stigmas noted, and their number compared with the number of those giving other than blue coloration. In this way the percentages of pieces other than crocus stigmas were determined in nine samples to be respectively as follows: 10, 32, 11, 22, 18, 26, 12, 52, 54 per cent. Two other samples are designated as spurious, and the twelfth as consisting of carthamus. In addition to these two samples obtained from different sections of Lancaster county were examined and found absolutely pure and free from any admixture whatsoever. The purest commercial sample was then shown to be only 90 per cent. pure. It is questioned whether the U. S. P. definition, requiring the drug to consist of stigmas only, is not too stringent and not practicable, the style and other parts of the flower being likely, though unintentionally, present, owing to difficulties of collecting stigmas only.—Amer. Jour. Pharm., Mar. 1900, 119–124.

Saffron—Chemical Relation of the Volatile Oil to the Coloring Matter. — In a paper presented to the Convention of German Naturalists and Physicians (Sept. 19, 1899), Dr. Hilger and O. Schüler communicate some interesting observations concerning the chemical relation of the volatile oil to the coloring matter of saffron. They found that when saffron is distilled by itself with water, scarcely any volatile oil is obtained. Somewhat more is obtained if the distillation is conducted in a current of carbonic acid; but if the contents of the still are acidulated with sulphuric acid, an abundance of volatile oil passes over. It is probable, therefore, that the volatile oil is produced by splitting up of the coloring matter molecule. The authors found, furthermore, that the coloring matter of saffron is identical with the carotin found in many plants, and that it must be regarded as a phytosterin-ester of the higher fatty acids. By the action of melting potassium hydrate, phytosterin was obtained, along with palmitic and other fatty acids.—Apoth. Ztg., Sept. 27, 1899, 575.

Saffron — Tinctorial Power. — Cæsar and Loretz report upon experiments made with a sample of saffron to determine its tinctorial power, which proved to be much greater than that determined by the Germ. Pharm. To carry out this test successfully, it is necessary, however, to subject the saffron to maceration with water during several hours. By macer-

ating 0.3 Gm. of the sample in 300.0 Gm. of distilled water for several hours a color solution was obtained which contained 0.0001 Gm. in 0.1 Cc. This latter quantity — $\frac{1}{1000}$ Cc.—was sufficient to impart a distinct color to 100 Cc. of distilled water, this dilution representing 1 part of saffron in 1 million parts of water. The Germ. Pharm. III. demands that 1 p. of saffron should communicate a distinct yellow color to 100,000 p. of distilled water when shaken with it.—Pharm. Centralh., Oct. 5, 1893, 611.

AMOMEACEÆ.

Ginger—Cultivation in Martinique.—Gaston Landes describes the cultivation of *Zingiber zerumbet*, Rosc. in Martinique, and states that it is also cultivated in St. Lucia, Dominica and Barbadoes, this industry being encouraged by the remunerative culture of the drug in Jamaica. The best quality of Martinique ginger consists of plump pieces of a uniform light color, free from moisture. Lower grades are black, or otherwise colored, wrinkled, damp and less aromatic. If the ginger be gathered before it reaches maturity, it will wrinkle during drying, and will be less aromatic and pungent than the mature rhizomes. The drying process must be perfect, otherwise the rhizome becomes mouldy.—Pharm. Journ., May 26, 1900, 567; from Rev. des Cult. Coloniales, 5, 329.

Cardamoms.—Practical identity of the volatile oils distilled from Malabar and Mysore fruits cultivated in Ceylon. See *Oil of cardamoms* under "Organic Chemistry."

ORCHIDEÆ.

Vanilla—Cultivation in Mexico.—C. H. Dietz has written an interesting paper on the cultivation of vanilla in Mexico, accompanied by illustrations showing the process of curing the bean, and distinctions between the bundles of the Mexican beans and those of the Bourbon and Tahiti beans, respectively. While the State of Vera Cruz has been considered the home of the vanilla, recent developments show that vanilla can be cultivated in the State of Tabasco and on the Isthmus of Tehuantepec. The true home of the vanilla, where it flourishes best in its wild state, is a narrow strip of territory about thirty miles wide, five miles back from the coast and ninety miles long, about 50 miles south of Tampico, along the Tuxpan, Casonez and Nautla rivers. There the cultivated varieties grow best and yield most largely without artificial fecundation, either on account of the large number of wild bees in this locality or by self-pollination. Artificial fecundation must, however, be practiced if it is desired to produce the beans in commercial quantities. Vanilla growing has so far been principally in the hands of Frenchmen, especially around Papantla —where the author's observations have apparently been made. These people settled there years ago; they came poor, but by industry and thrift they soon put their plantations on a paying basis and prospered.

Women and children all turn out to help at the planting (May to June), and the harvesting season (November to January). The wild vanilla, which sometimes makes its appearance on the market, is mostly hunted and gathered by Indians. For the details concerning the cultivation, curing and preparation for the market of this important product the original paper must be referred to in Amer. Drugg., Aug. 25, 1899, 99–100.

Vanilla—Determination and Percentage of Vanillin.—W. Busse determines the amount of vanillin in the pods by crushing them with sand, extracting with ether in a Soxhlet tube, and shaking out the ethereal extract with solution of sodium bisulphite. From this the vanillin is liberated by treatment with sulphuric acid, expelling the sulphurous acid generated by means of carbonic acid, and then extracting with ether, which dissolves the vanillin and leaves it in a weighable condition on evaporation. In this way the author found the following percentages of vanillin in different sorts of vanilla: In East African vanilla, 2.16 per cent.; in Ceylon vanilla, 1.48 per cent.; in Tahiti vanilla, from 1.55 to 2.02. Tieman and Haarman found from 1.94 to 2.90 per cent. of vanillin in the best Bourbon vanilla and 2.75 per cent. in the best Java vanilla. Busse, however, does not consider that the vanillin content of a sample of vanilla bears any marked relation to its value as a flavoring agent, the aroma of the pods not being solely due to the vanillin. Furthermore, he does not attribute the cases of so-called vanilla poisoning to any of the vanilla constituents, but to other ingredients contained in vanilla-flavored foods.—Pharm. Journ., Oct. 21' 1899, 377; from Ztschr. f. Unters. d. Nahr. u. Genussm., *6*, 519.

Vanilla—Questionable Pre-existence of Vanillin.—Supplementary to the studies of W. Busse on the dry method of curing vanilla (see Proceedings, 1899, 517, Prof. J. Behrens has made some experiments to determine the question of the existence of vanillin in the ripe fruit prior to the curing process, this being an open question from the fact that the uncured vanilla possesses little or no odor of vanillin. Upon the basis of experiments made with the fresh leaves of *Vanilla planifolium* he believes that he is justified to assume that the vanillin does not pre-exist in the fruits, but that it is formed together with sugar by the splitting up of an existing glucoside during the process of curing. If this assumption is verified, it is very probable that the hydrolysis of the glucoside is effected by the agency of a ferment similar to emulsin.—Apoth. Ztg., Dec. 16, 1899, 760; from "Tropenpflanzen," 1899, 299.

Vanilla—Adulteration.—The "Pharm. Ztg." (May 30, 1900, 415) states that in order to give to the commoner grades of vanilla the appearance of the vanillin efflorescence which forms on Bourbon vanilla on keeping, the practice has recently been introduced in Hamburg to sublime benzoic acid upon the drug. The crystalline efflorescence so produced is identified readily by its acidulation, as well as by the characteristic reaction of benzoic acid. The acid is isolated by dissolving the crystals in ether, shaking

the ether solution with the aqueous bisulphite solution to remove any vanillin that may be present, then evaporating the ethereal solution, which leaves the acid in a crystalline condition.

SANTALACEÆ.

Sandal-Wood—Plantations in British India.—The "Conservator of Forests" at Mysore, Mr. J. L. Pigot, has published some notes on the British exhibit at the Paris Exhibition, in which noteworthy particulars are found concerning the sandal-wood production in British India. The home of the sandal-wood tree is Mysore, where it has been monopolized by the Government. It is also found in Coorg and in some of the districts of the Bombay and Madras Presidencies, but Mysore supplies about seven-eighths of the whole trade. The total area of the sandal-wood plantations covers about 6450 square miles. In the Kolar and Chitaldroog districts, and in parts of Tumkur and Bangalore, sandal-wood is scarce and its quality is inferior, while in the highlands, which form the eastern and southern boundaries of Mysore, it is altogether absent. The full-grown trees, or those which have died off, are dug out and transported to one of the warehouses, called "Kothis," of which there are eight: at Hunsur, Seringapatam, Bangalore, Hassan, Chickmagalur, Tirthahalli, Thimoga and Sagar. Here they are freed from the bark, and sorted into root, trunk, branch wood, eighteen different kinds being sold according to the new classification (1898), from first-class trunk wood to chips and sawdust. The stocks of wood are annually sold by public auction, in November and December, by turns at the different Kothis. It is thence brought by rail to Bombay or the ports on the West Coast, such as Goa, Hanovar, Kundapur, Mangalore, etc., and from there shipped to Europe, to China, or to other parts of India. Mr. Pigot says that the distillation of sandal-wood oil is now carried on on the West Coast of India, and by means of a rough and unpractical process. It is evident that it is only by means of a thoroughly up-to-date distillatory plant, that a product can he made which answers the high requirements of the present day.—Schimmel's Semi-An. Rep.,April, 1900, 40.

ELÆAGNEÆ.

Hippophæ Rhamnoides—Occurrence of Malic Acid in Fruit.—According to H. Erdman the yellow berries of the sea buckthorn (*Hippophæ rhamnoides*) contain a large amount of malic acid, together with mannite. The orange-yellow juice of the berries when neutralized with chalk gives a slightly colored liquor when filtered, most of the colored constituent remaining mixed with the excess of chalk. On heating the clear liquor to boiling an abundant deposit of white granular crystals separates, consisting of calcium malate, having a composition represented by the formula $C_4H_4O_5Ca + 1\frac{1}{2}Aq$. The rotary power of an ammonium salt of the acid was found to be $-2^{\circ}94'$, showing that the acid is identical with that of ser-

vice berries (*Pyrus aucuparia*). Examination of the syrupy mother liquor from calcium malate led to the conclusion that the crystals deposited after some time consisted essentially of a calcium compound of mannite.—Pharm. Journ., Dec. 23, 1899, 601; from Berichte, 32, 3351.

PROTACEÆ.

Grevillea Robusta—Analysis of a Gummy Exudation.—Roeser and Puaux have subjected a gum which is exuded on the branches and trunk of *Grevillea robusta* to examination and analysis. It has an astringent taste, but no smell. When dried at 100° C., it takes an odor of caramel and becomes very friable. Its aqueous solution is colorless or limpid, or perhaps slightly clouded; it is neutral to litmus. It is easily precipitated by alcohol at 95°; it is also precipitated by the basic acetate of lead after the solution has been made slightly alkaline with ammonia. It reduces a cupro-potassic solution very slightly. It is not acted upon by potassium silicate, stannous chloride, or mercurous nitrate. When treated with mineral acids, this gum gives galactose and pentaglucose (arabinose), the quantity of the former being slightly in excess of that of the latter.—Chem. News, Feb. 9. 1900, 71; from Journ. de Pharm. (6) x, No. 9.

T'ung Oil—Use as a Paint.—According to the U. S. Consul at Shanghai the oil extracted from the seed of *Dryandra cordosa*, known locally as the "paint tree," is used under the name of t'ung oil by the natives of the Yangtze valley, where the tree is extesively cultivated, as a standard paint. When boiled, it makes one of the best drying oils; it is also extensively used in varnishing with the famous Ningpo varnish, t'si, which is the dried sap of *Rhus vernicifera*. The seeds of the "paint tree" are poisonous.—Pharm. Journ., March 17, 1900, 277; from Journ. Soc. Arts, *48*, 397.

LAURACEÆ.

Camphor—Artificial Production from Oil of Turpentine.—J. E. T. Woods has patented (Eng.) the following processes for preparing camphor from American oil of turpentine:

1. Terebinmonohydrochloride is prepared by the action of gaseous hydrochloric acid upon the turpentine and, after purification by sublimation in a current of steam, is converted into solid camphen by boiling with sodium acetate and an alkali hydrate or carbonate. The camphen is then oxidized to form camphor by heating with an alkaline permanaganate, chromate, dichromate, ferrate, or chlorate and very diluted sulphuric acid.

2. Camphoric acid, $C_{10}H_{16}O_4$, is formed by subjecting American or other turpentine oils to the prolonged action of hot air and steam, during which reaction hydrogen peroxide is also formed. By the reducing action of nascent hydrogen upon an aqueous solution of camphoric acid so obtained, camphor is then produced. The hydrogen for this reaction may be obtained by the electrolysis of the solution of camphoric acid, or by the introduction of zinc or iron and diluted sulphuric acid.

3. Alternatively, camphoric acid is boiled with 3 equivalents of camphene in the presence of sodium acetate or sodium formate, whereby both substances are converted into camphor. Apoth. Ztg., Nov. 4, 1899, 661; from Chem. Ztg., Nov. 4, 1899, 945.

Cinnamon Chips—High Ash Content.—Heretofore an ash content of 5 per cent. and of 1 per cent. of sand has been the extreme limit allowed by the authorities of certain German states in both Chinese and Ceylon cinnamon powders. In recent years powdered cinnamon prepared from Chinese so-called "Cinnamon chips," has appeared in the market, which contains an appreciably higher ash content. G. Rupp has subjected an original bale of the so-called cinnamon chips, imported from China, to examination, and found it to contain considerable quantities of small stones, sand and dust, being composed essentially of thick, coarse bark fragments from older branches, together with small quantities of the bark of younger branches, and some of the wood. Ceylon cinnamon chips showed a more uniform composition, and contained considerably smaller quantities of mineral substances, particularly sand. A nearer examination of the Chinese cinnamon, both in its original condition, and after garbling and sifting to remove the stones, sand and dust, yielded the following results:

Original.	Garbled and Sifted.
5.43 per cent. Ash with 2.82 per cent. sand.	5.03 per cent. Ash with 0.82 per cent. sand.
6.00 per cent. Ash with 2.90 per cent. sand.	4.98 per cent. Ash with 0.79 per cent. sand.
5.95 per cent. Ash with 2.85 per cent. sand.	4.57 per cent. Ash with 0.90 per cent. sand.

On the basis of these observations the authorities of the grand duchy of Baden have now increased the limit of mineral content to 6 per cent. ash with 3 per cent. of sand in commercial powdered cinnamon.—Apoth. Ztg., Aug. 19, 1899, 493; from Ztschr. f Unters. der Nahr. u. Genussm., 1899, 209.

MYRISTICACEÆ.

Fictitious Nutmegs—Occurrence in Commerce.—J. Vanderplankin calls attention to the presence in commerce of artificial nutmegs, composed of a compressed powder mixed with earthy matter. On cutting these nutmegs the absence of vegetable structure is observed, and by heating for three minutes in boiling water they are softened and fall to pieces on rubbing between the fingers. The ash varies from 11 to 18 per cent., while the pure nutmeg only gives 2 to 3 per cent. The adulterated samples are also, in general, heavier. F. Ranwez has analyzed various samples of these spurious nutmegs; he observes that in appearance they are similar to the genuine seeds, but the odor and taste are not quite normal. The fictitious nuts, freed from adhering white powder, gave the following figures as compared with the results obtained by Koenig from genuine nutmegs:

	False nuts.	Genuine nuts
Moisture	11.09	7.38
Ash	11.34	2.70
Ash insoluble in HCl (SiO_2)	3.90	—
Concrete nutmeg oil (ether extract)	15.42	34.27
Volatile oil	1.76	3 05
Cellulose	7.24	9.92

The author obtained the following results in the examination of genuine nuts:

	3 samples whole nuts.			2 samples pure powder.	
Moisture	15.53	14.54	14.57	8.59	9.09
Ash	1.27	3.29	2.73	1.78	4.88
Concrete oil	31.38	33.40	37.62	39.60	32.02

—Pharm. Journ., June 23, 682; from Chem. Zeit. Repert. *24*, 31.

POLYGONACEÆ.

Rheum Franzenbachii, Münter—Not the Mother-Plant of "True" Chinese Rhubarb.—Prof. H. Moeller has succeeded in growing plants from seeds of *Rheum Franzenbachii*, claimed to be the mother-plant of "true" Chinese rhubarb, and subjected the roots to critical examination. He finds that these roots differ very materially in their morphological structure from "true" Chinese rhubarb, from which they differ moreover also in odor and taste.—Apoth. Ztg., Dec. 20, 1899, 766; from Ber. d. Deutsch. bot. Ges.

Rhubarb—Constituents of Different Sorts.—O. Hesse has made an extensive series of investigations to determine the constituents of the different sorts of rhubarb. By means of ether he obtained from

Chinese Rhubarb, chrysophanic acid, emodin, rhubarberon and rhein. The *chrysophanic acid*, as obtained by several recrystallizations from alcohol, generally contains more or less *methyl-chrysophanic acid*, but crystallizes (pure ? Rep.) from glacial acetic acid in form of small, yellow scales, having the composition $C_{15}H_{10}O_4$. When heated with strong hydriodic acid it is transformed into *chrysophanhydroanthone*, according to the following equation: $C_{15}H_{10}O_4 + 4HI = C_{15}H_{12}O_3 + H_2O + 4I$. *Emodin* crystallizes from hot diluted acetic acid with 1 mol. of water of crystallization ($C_{15}H_{10}O_5 + H_2O$), and corresponds in every respect with emodin from buckthorn bark. *Rhubarberon*, $C_{15}H_{10}O_5$, forms small yellow scales, melting at 212° C. It is insoluble in water, sparingly in cold alcohol, readily in hot alcohol. *Rhein*, $C_{15}H_{10}O_6$, is very sparingly soluble in hot glacial acetic acid, alcohol, benzene and toluene, and therefore easily separable from the before-mentioned constituents.

Austrian Rhubarb, from *Rheum rhaponticum*, contains a new substance, *rhapontin*, in small quantities. Rhapontin, $C_{22}H_{24}O_9$ or $C_{21}H_{24}O_8(CH_3O)$, forms yellowish-white prisms, which dissolve with tolerable readiness in

boiling water, sparingly in cold water, and hardly at all in hot alcohol, benzene, or acetone. It is tasteless and melts at 235° C. with decomposition. Besides rhapontin, this variety of rhubarb contained only chrysophanic acid.

English Rhubarb, from *Rheum palmatum*, yielded the same constituents as Austrian rhubarb, namely chrysophanic acid and rhapontin. The author also determined the constituents of three kinds of rumex root. The root of

Rumex Nepalensis contains, as already reported by Witte, as important constituents only chrysophanic acid and nepodin, the latter in large quantities. *Nepodin*, $C_{18}H_{16}O_4$, crystallizes from a hot mixture of benzene and benzin in golden-yellow needles and scales. From the root of

Rumex palustris these same constituents were also obtained, but in the root of

Rumex obtusifolia a new constituent, *lapodin*, $C_{18}H_{16}O_5$, was found, together with chrysophanic acid and nepodin. Lapodin crystallizes from hot alcohol, benzene and glacial acetic acid in form of handsome yellow needles. From the foregoing experiments, in so far as Chinese, Austrian and English rhubarbs are concerned, the author concludes it to be improbable that the Chinese and English rhubarbs are derived from the same plant, since the former does not contain the rhapontin, which is found in both Austrian and English rhubarb roots. For the species of *Rheum* yielding the Chinese drug the designation *Rheum officinale* should be retained.—Apoth. Ztg., Dec. 23, 1899, 777; from Liebig's Annalen, 1899, *302*, 82.

Rumex—Occurrence of Special Yellow Coloring Matter in the Root of Different Species.—See *Nepodin*, under "Coloring Matters."

Rumex acetosa—Fatal Poisoning by the Leaves.—Dr. H. Einhorst calls attention to a fatal case of acute inflammation of the kidneys induced by eating the young leaves of *Rumex acetosa*, which are eaten on account of their pleasant acidulous taste, and are usually regarded to be innocuous, although it is well known that, as in the stems of rhubarb, the acidity is due to oxalic acid. In the case mentioned, the urine of the patient was blood-red, densely turbid with a heavy deposit, and contained a large quantity of albumen (14 per cent. by Esbach's method), evidently derived from the abundant blood corpuscles found in the deposit. — Pharm. Centralh., Aug. 10, 1899, 489: from D. Med. Wochenschr., 1899, 449.

SCROPHULARIACEÆ.

Digitalis.—Comparison of Austro-Hungarian with English and German-grown Leaves. — Hans Benyschek has had opportunity to collect digitalis leaves grown in Bohemia, Styria, Hungary, Slavonia, Istria, Dalmatia, etc,, and has made innumerable analyses of them, following Fromme's modification of Keller's method, with the view to arriving at a comparison with

leaves grown in England, in the Harz and in Thuringia. He finds that the digitalis leaves gathered by him in the countries and districts named compare favorably in every respect with the English and German-grown leaves, the yield of proximate principles depending inversely on the amount of moisture contained in them, being smallest towards the fall of the year, when the amount of water in the fully developed leaves is greatest. The author also finds that the removal of the stems from the leaves is a disadvantage, the yield of active constituents being invariably less from leaves without stems than from leaves with stems. As to the preservation of digitalis leaves, the author finds containers of dark-brown or black glass, hermetically closed, to answer admirably, leaves so preserved having remained in unimpaired condition for 2½ years. The best method of preservation, however, he considers the enclosure of the leaves in tins over (well burnt? Rep.) lime, since this completely excludes moisture, which is an important factor in the decomposition of digitonin. The author, furthermore, makes some practical remarks on the preparation of the *Infusion of Digitalis*, which see, under "Pharmacy."—Pharm. Post, 1899, 451.

Digitalis — Assay of German and English Leaves. — A. R. L. Dohme and H. Engelhard, following Keller's method for determining digitoxin—which they describe in full — subjected German and English grown digitalis leaves to assay, with the following results:

Digitalis, German, No. 1	—0.340	per cent.	digitoxin as the mean of	4	assays.			
" " " 11	—0.490	"	"	"	"	"	"	"
" English	0.745	"	"	"	"	"	"	"

While the figures show the superior digitoxin value of the English grown leaves, this is not commensurate with the price, which is 1000 per cent. higher than that of the German leaves. Moreover, Keller has shown that several samples of German leaves contained as much as 0.620 per cent. of digitoxin.—Proc. Maryland Phar. Assoc., 1899, 133.

Digitalis — Percentage of Digitoxin Before and During the Flowering Period — Cæsar and Loretz report the results of experiments made with digitalis leaves collected before flowering and the same gathered when the plant was in flower, as is officially required (Ph. Germ.). The leaves from non-flowering plants yielded 10 per cent. more of pure digitoxin than those from flowering plants, the average yield being 0.3 per cent. The flowers with the calyx yielded the same percentage of digitoxin as the leaves of plants growing in the same locality. The leaves of two-year-old non-flowering plants yielded 0.288 per cent. of digitoxin, the undeveloped leaves from flowering plants one year old only 0.107 per cent. The stability of the drug when stored in bales, in the usual way, protected from the light, was foun dto be good. Leaves from the Harz which assayed in 1898 0.360 per cent. digitoxin, assayed after a year 0.346 per cent., these results being obtained with average samples taken from several bales. — Pharm. Centralh., Oct. 5, 1899, 611.

Digitalis Lutea—New Yellow Coloring Matter Distinct from "Digitoflavone."—Adrian and Trillat have isolated from the residue obtained in the preparation of crystalline digitalis from the Hungarian *Digitalis lutea*, a yellow coloring matter which they consider to be distinct from the digitoflavone of Fleischer, and to which they attribute the formula $C_{16}H_{12}O_5$. It is remarkably resistant to the action of chemical reagents, boiling hydrochloric acid does not decompose it, nor is it affected by acetic acid nor by phenylhydrazine. It is insoluble in water, in dilute acids and in petroleum ether, but dissolves in alcohol, in chloroform, and in amylic alcohol. It gives a bright red color with alkali. It is not a decomposition product of chlorophyll, and differs from carotin. It forms fine yellow silky felted needles, which melt at 217–218° C.—Pharm. Journ. Jan. 27, 1900; from Compt. rend., *129*, 889.

Curanga Amara, Juss.—A new glucosidal constituent, *Curangin*, which see under "Organic Chemistry."

SOLANACEÆ.

Belladonna Root—Assay—Process With Acetic Acid as Menstruum.—During the past fourteen years Dr. E. R. Squibb has employed a method for the assay of alkaloid in belladonna root with satisfaction, which depended on the extraction of the drug with 91 per cent. alcohol containing a little sulphuric acid. He now, in connection with his studies on the relative value of acetic acid and ethyl alcohol for the extraction of drugs (see *Fluid Extract of Belladonna Root*, under "Pharmacy") proposes a simplified method, in which 10 per cent. acetic acid is used for the extraction, as follows: Ten Gm. of the unpeeled belladonna root in No. 60 powder are extracted by percolation (preferably in an extractor similar to the one proposed by him for the assay of *Cinchona*, which see). About 200 Cc. of percolate are thus obtained, which yielded on evaporation, in the experiment described, 3.96 Gm. of dry extract. This was dissolved in 20 Cc. of a mixture of equal volume of 91 per cent. alcohol and 10 per cent. water of ammonia, transferred to a separator, and shaken out with 20 Cc. of chloroform, making sure by means of wetted litmus, held in the vapor space of the separator, of the full alkalinity of the contents. Having drawn off the chloroform, the residue is shaken out twice more with 20 Cc. of chloroform, after adding 4 Cc. of 91 per cent. alcohol each time. On evaporating the united chloroform solution, a residue weighing 0.15 Gm. was obtained. This dissolved in 6 Cc. of decinormal acid, and titrated back with decinormal alkali, using litmus as indicator, gave 0.680 per cent. of alkaloid, the same amount being obtained in duplicate assay, as well as by the more circumstantial process heretofore employed by the author.—Amer. Journ. Pharm., Jan., 1900, 4–6.

Belladonna Leaves—Improved Assay and Results with Leaves from Various Sources.—In a previous paper (see Proceedings, 1899, 522), Frank X. Moerk had drawn attention to the fallacy of Keller's assay process, and

to the difficulty of extracting belladonna leaves with 95 per cent. alcohol, and proposed a process in which complete extraction of the leaves with the official fluid extract menstruum (2 vols. alcohol and 1 vol. water), and completion of the assay with the entire quantity of extract was recommended. Since then experiments have been made which tend to improve this assay process in several directions. A menstruum composed of 90 parts of 95 per cent. alcohol and 10 parts of official ammonia water is found to be a superior solvent. With 200 Cc. of this menstruum, 20 grammes of the drug can be perfectly extracted by immediate percolation. The extract obtained from the percolate can be perfectly removed from the capsule and transferred to the separator by using 0.5 Cc. of water of ammonia and 10 Cc. of water in proportions of 1 and 2 Cc. The presence of chlorophyll in the alkaloidal residue can be prevented by filtering the acid extractive. What at first appeared to be an objection to the use of this solvent was the tendency to form persistent emulsions in the alkaline extractions which did not break up upon the addition of stearic acid and agitation; this was successfully remedied by stirring the emulsified layer with a piece of iron wire, upon the end of which a little stearic acid had been poured and allowed to cool; by drawing off the clear portion and repeating the operation several times, if necessary, almost the entire quantity of the solvent can be separated. If, as may happen, the last portions of the emulsion are so thick that further separation will not take place, it suffices to mix the emulsion with the aqueous solution by gentle agitation. On allowing it to separate, it will be found that stearic acid will again perform its function. In accordance with these observations the author recommends an improved assay process, which is given in detail, and may be consulted in the original paper. The results of analyses of different samples of belladonna leaves by this process show slightly higher yields of alkaloid than are obtained by the process previously recommended by the author, as is shown in the following table:

	New Process.		Original Process.	
	Moisture Per cent.	Alkaloid Per cent.	Moisture Per cent.	Alkaloid Per cent.
Powdered leaves, B	9.15	{ 0.4944 { 0.4997	9.15	{ 0.4839 { 0.4891
English leaves, cultivated	8.85	0.6312	8.40	{ 0.5996 { 0.6040
German leaves, cultivated	8.43	0.5155	7.60	{ 0.5155 { 0.5050
German leaves, wild I	8.50	———	6.80	{ 0.4997 { 0.4997
German leaves, wild II	8.60	0.4208	———	
Powdered leaves, K	7.60	0.3629	———	

—Proc. Penna. Pharm. Assoc., 1899, 97–102; Amer. Jour. Pharm., July, 1899, 320–326.

Belladonna Leaves—Percentage of Alkaloid in Commercial Samples.—Charles H. La Wall and Robert C. Pursel report the results of assay of ten samples of belladonna leaves, the estimation of alkaloid in each case being made both by the titrimetric and gravimetric method. The averages for the ten samples were as follows: by the titrimetric method, 0.3227 per cent (lowest, 0.220; highest, 0.430): by the gravimetric method, 0.3525 per cent. (lowest, 0.241; highest, 0.460). The commercial standard is 0.40 per cent. of alkaloid, and it would appear therefore that the standard has been placed too high for this drug. The average amount of moisture was 8.32 per cent. Incidentally, the authors mention that a very material reduction in the time of the assay was made by titrating directly from the first chloroform-ether residue, as in the case of nux vomica. They proceed as follows:

The chloroform-ether extract is evaporated to dryness and several portions of ether are successively added and evaporated, thereby removing all traces of ammonia. A small amount of alcohol is added and an excess of $\frac{N}{10}$ acid is run in from a burette, the amount being carefully noted. A large amount of water is now added and then about 10 to 15 Cc. of chloroform, and the whole well stirred. After several minutes the chloroform separates completely and contains all the fatty matter and chlorophyll, leaving the supernatant aqueous liquid practically colorless. The desired indicator may then be added and titration successfully carried out, totally unobscured by chlorophyll.—Amer. Journ. Pharm., Aug., 1899, 394; Proc. Penna. Pharm. Assoc., 1899, 155.

Belladonna and Henbane Leaves—Results of Assay.—A. R. L. Dohme and H. Engelhardt report the results of the assay by a modification of Keller's method described—obtained as an average of five samples each of English and Hungarian belladonna leaf and hyoscyamus leaf, as follows:

Belladonna leaf: English, 0.648 per cent.; Hungarian, 0.416 per cent. total alkaloids.

Henbane leaf: English, 0.557 per cent.; Hungarian, 0.508 per cent. total alkaloids.

The unusually high amount of alkaloids obtained in the case of henbane, the authors cannot explain. Error is excluded, because the assays were made in quintuplicate and at different times.—Proc. Maryland Pharm. Assoc., 1899, 130.

Scopola—A Valuable Addition to the Pharmacopœia.—Prof. V. Coblentz reviews the recent developments concerning the chemical investigations of the alkaloidal constituents of scopola rhizomes, more particularly those made by Dr. Hesse (see *Solanaceum Alkaloids*, under "Organic Chemistry"), and concludes that scopola rhizome, because of its greater constancy, qualitatively and quantitatively, in alkaloidal content, is to be preferred to belladonna root in securing preparations of a uniform standard.

This was also the consensus of opinion among various European authorities whom he consulted while abroad last summer. Official recognition of scopola is certainly warranted by the facts, at least nine-tenths of its alkaloid being practically identical with that of belladonna, any difference in the case of the other tenth being rather desirable than otherwise.—Pharm. Era, March 15, 1900, 285.

Stramonium Seeds—Absorption of their Atropine Content during Growth.—From observations made on germinating seeds of *Datura stramonium* and on growing plants, J. Thomann concludes that the greater part of the atropine contained in the seed is absorbed during growth, even when the culture is kept entirely free from bacteria and mould-fungi. He is therefore of the opinion that the alkaloid is a reserve-food-material rather than a product of excretion.—Pharm. Journ., March 10, 1900, 249; from Bot. Centralbl., *80*, 461.

Datura Alba—Percentage of Hyoscine and Other Alkaloids in the Flowers.—The following additional information concerning the alkaloids in *Datura alba* contributed in Dr. Hesse's paper, quoted in last year's report (see Proceedings, 1898, 746), will be found of interest in connection with the author's recent paper on the *Solanaceous Bases* (which see, under "Organic Chemistry." The relative proportions in which these bases are present in the flower of *Datura alba* are, hyoscine, 0.51 per cent., hyoscyamine, 0.03 per cent., atropine, 0.01 per cent., so that the hyoscine amounts to 92 per cent. of the total alkaloid present. This observation is of considerable practical importance. Hitherto, hyoscine has been obtained only from henbane and from scopolia root, and while it can be separated from its associated alkaloids in henbane with comparative ease, the total alkaloid in henbane is only 0.25 per cent., of which hyoscyamine composes from 70 to 80 per cent. In scopolia root, on the other hand, the hyoscine is associated with atroscine and probably a third alkaloid, all of isomeric composition, and amounts to only about 4 per cent. of the alkaloid present, which is not more than 0.4 per cent. altogether. This alone would make the preparation of hyoscine from the latter source rather difficult: but, in addition, the separation of hyoscine from its isomers is practically impossible, and hence it may be understood why the commercial scopolamine is not, as it is regarded by some, pure hyoscine. On the contrary, the flowers of *Datura alba* yield hyoscine of excellent quality, and it is probable that the purer product from that source will supersede the mixture known by the name of scopolamine salt.—Pharm. Journ., March 10, 1900, 250–252.

Cayenne Pepper—Analyses of Samples of Reliable Quality.—William C. R. Kynaston, having had occasion to examine some samples of Cayenne pepper, examined three different samples of reliable qualtity and purity in order to establish standards. His results are recorded in the following table. Sample *A* was ground in the author's laboratory from chillies,

sample *B* from Japan chillies, and sample *C* was a commercial sample of known purity.

	A per cent.	*B* per cent.	*C* per cent.
Moisture	9.90	8.90	9.12
Ethereal extract	21.08	20.91	20.97
Alcoholic extract	9.54	10.43	15.12
Woody fibre	22.09	25.30	17.96
Total ash	6.27	6.50	5.66
Insoluble ash	1.22	1.51	1.10
Sand	0.11	0.06	0.16
Alkalinity of ash as K_2O	1.79	1.91	1.53
Percentage of alkalinity as K_2O in total ash	28.55	29.38	27.03

It will be noted that the percentages of ethereal extract and of alkalinity are fairly constant.—Chem. News, March 9, 1900, 109.

Tobacco — Estimation of Nicotine. — C. C. Keller recommends the following method for estimating nicotine in tobacco: 6 Gm. of the dry tobacco are shaken vigorously in a 200 Cc. flask, with 60 Cc. each of ether and petroleum-ether, 10 Cc. of solution of potassa (20 per cent.), and the shaking is repeated frequently during half an hour. After the mixture is allowed to stand during 3 to 4 hours, 100 Cc. of the solution are filtered through a small plaited filter into a 100 Cc. flask, and a strong current of air is passed through the filtrate in order to drive off the ammonia (a small quantity of which is liberated during the process (until moistened red litmus paper is no longer blued (when exposed to the air passed through the solution ? Rep.). After ammonia has thus been completely eliminated, 10 Cc. of alcohol, and one drop of iod-eosine in 10 Cc. of water are added, the flask is stoppered, and the contents are vigorously shaken. The nicotine and iod-eosine are taken up by the water, which separates of a red color; $\frac{N}{10}$ hydrochloric acid (say 7 Cc.) is then added, followed, if necessary, by further portions of 1 Cc. at a time until the red color of the aqueous layer is discharged. The excess of acid is then determined with $\frac{N}{10}$ ammonia, the volume required being deducted from the volume of $\frac{N}{10}$ hydrochloric acid to ascertain the quantity of the latter required to neutralize the nicotine. Each Cc. of $\frac{N}{10}$ hydrochloric acid corresponds to 0.0162 Gm. of nicotine, and the total quantity of the alkaloid is then ascertained by simple multiplication with the number of Cc. of acid consumed. The product, multiplied by 20, gives the percentage.—Apoth. Ztg., Dec. 16, 1899, 759; from Schweiz. Wochenschr. f. Pharm., 1899, 309.

Tobacco—Poisonous Constituent of the Smoke.—H. Thoms has isolated a very poisonous oily body from tobacco smoke, to the presence of which the observed toxic effects of tobacco are attributed, since it is known that

these effects are not altogether dependent on the proportion of nicotine in the tobacco. The new substance produces violent headache, giddiness and trembling. The greater portion of it boils at 220° to 230° C., and by treatment with 2 per cent. potash solution a phenol-like body, boiling at 190°–200° C., and having a creosote odor, may be separated. — Pharm. Centralh., 1899, 706.

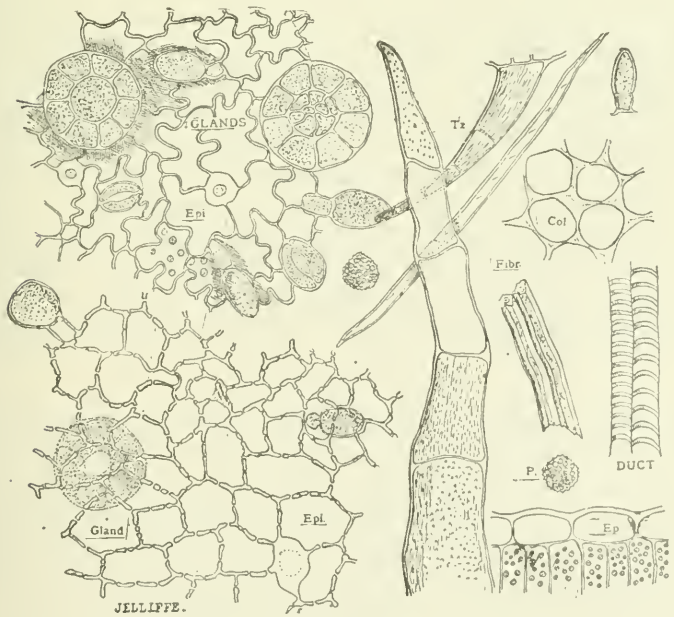
ACANTHACEÆ.

Blepharis Capensis — A New Drug from South Africa. — Merck & Co. (Annual Report, 1899) call attention to a new South African drug, composed of the herb and fruits of *Blepharis capensis*, which enjoys a great reputation among the South African colonists as a remedy in cases of blood poisoning, and as an antidote to snake bites, and for the relief of toothache. For the treatment of snake bites, a poultice of the powdered drug is applied to the wound, and a decoction of it is given internally.—Pharm. Ztg., March 10, 1900, 191.

LABIATÆ.

Mentha Piperita—Histological Elements of the Powder.—After a gen-

FIG. 60.



Mentha Piperita, in Powder —Epi, epidermis, above, of upper side, below, underneath showing the pitted parenchyma; Glands, Tr., hairs or trichones; Col, collenchyma; P, pollen grains from flower; Ducts; Ep, cross-section of epidermis showing palisade cells; Fibr, fibers from midrib.

eral description of the morphological characters and the microscopic structure of peppermint leaves, Prof. Smith Ely Jelliffe points out the

characteristic elements (see Fig. 60) that are exhibited under the lens in a medium fine-powdered drug, which is dark green in color, as follows:

Parenchyma, rich in chlorophyll, simple multicellular hairs, oil glands, sometimes showing menthol crystals within, glandular hairs, ducts, fibres, fragments of floral tissues, collenchyma and pollen grains. The parenchyma is usually thin-walled and filled with chlorophyll grains; at times it is richly pored; the average diameter of the cells ranges from 60 to 80 mikra. The hairs are striking; they are thin-walled, usually long and many-celled, the walls being marked with fine longitudinal striæ. These simple multicellular hairs are non-glandular. They may contain chlorophyll grains or unorganized contents. Small glandular hairs are also present. These are composed usually of two cells, a small quadrangular basal cell and an enlarged pyriform apical cell. The oil glands are characteristic, they are globose and slightly flattened, multicellular with a short basal pedicel, and filled with oil, in which, at times, crystals of menthol may be present. Their walls are thin, but resistant to evaporation. Ducts are not common in the powder; they are usually delicate and are either annularly or spirally thickened: pitted ducts may be found in specimens which have an appreciable quantity of the stout stems present. Fibers are also few in number in the powder. Bast fibers are apt to be isolated. Wood fibers are in groups. The walls of each type of fiber are but slightly thickened. Fragments of delicate, flat tissue, derived from the plant corolla, may be found; these are slightly colored, usually brownish, and readily recognized. Pollen grains are also not infrequent. The grains are echinate, roughened with minute spines, are globular, sometimes pointed at one side, to ovoid triangular. The surface is undulate and they average in size, when examined in oil, 18.5 to 21.5 by 20 to 21 mikra, being almost double the size of the pollen grains of *Mentha viridis*, which moreover are distinctly triangular. Collenchymatic tissues of no particular characters are present; these are derived from the structures of the midrib and the angles of the stem.—Drugg. Circ., Nov., 1899, 252.

CONVOLVULACEÆ.

Convolvulus Althæoides—The Resin, a Substitute for Scammony and Jalap Resins.—According to N. Georgiades the dried root of *Convolvulus althæoides*, a plant very common in Syria, yields about 7 per cent. of a purgative resin, which might perhaps with advantage be substituted for the more costly scammony or jalap resins. The resin has a greenish yellow color, is glucosidal in reaction, and only partly soluble in ether.—Pharm. Journ., Sept, 9, 1899, 335; from Journ. de Pharm. (6), *10*, 117.

APOCYNACEÆ.

Strychnos—Poisonous and Innocuous Species.—Dr. A. Gilg observes that in the history of plants it is a remarkable manifestation that the members

of entire plant groups or natural orders should often possess very similar or even absolutely identical physiological activity, though they may differ morphologically to an extraordinary degree. Instances of these are members of the "Gentianaceæ," the "Simarubaceæ," the "Anacardiaceæ," and the "Burseraceæ." Again, there are families in which this similarity of physiological activity is confined to members of the different genera, as for instance in apocynaceous genera *Carissa* and *Acocanthera*, the members of the first producing edible fruits, whilst those of the latter genus embrace some of the most powerful poisons. The genus *Strychnos*, belonging to the closely allied family of the "Loganaceæ," however, occupies a peculiar position in this respect, some species being innocuous, like those of the "Gentianaceæ," while others, as is well known, are quite poisonous. Such poisonous species are *Strychnos nux vomica* and *Strychnos Ignatii*, Berg., while numerous species of *Strychnos* in South America yield the arrow poison, "curare." In Java and Borneo an arrow poison is prepared from *Strychnos Ticute*, Lech., and ordeal poisons are prepared from different African species, such as *Strychnos Icaja*, Baill., from the Gaboon, and *Strychnos Kipapa*, Gilg., from the Upper Congo. There exists a remarkable difference, however, in physiological action of the American and Malayan species of *Strychnos*, on the one hand, and the African species on the other. In all of the species named, the poison is extracted from the bark; but the curare poison is effective only when introduced into wounds, having very little effect when introduced into the stomach, whereas the poisons from the African species are effective only when taken internally.

Some species of *Strychnos* contain the same poison in all parts of the plant, as does *S. nux vomica*, for instance. Others contain different constituents in the different organs and parts of the plant. Of African species some yield strong poisons both in the bark and in the fruit, whilst others again yield edible fruits, resembling in these qualities the acidulous character of oranges. Thus all species related to *Strychnos spinosa* Lam., indigenous to Madagascar, as far as they have become known, appear to produce edible fruits. Such are *S. Volkensii* Gilg., producing a large pulpy fruit, and *S. cerifera* Gilg., which produces a small single-seeded fruit, resembling cherries in size and shape. Both of these fruits, notwithstanding their difference in size and shape, are known by the natives under the same name, "Intonga" or "Tonga." In western Africa, besides many other species of Strychnos, occur two very similar ones, the one, *S. cocculoides* Bek., yielding an edible fruit which is largely consumed, while the other, *S. Dekindtiana* Gilg., is known to be highly poisonous. The author's paper is illustrated by cuts showing a number of the species of *Strychnos* referred to, but which it is impracticable to reproduce here.—Apoth. Ztg., June 9, 1900, 386.

Strychnos Seeds—Character of Albumen present in them.—See *Albumin* under "Organic Chemistry."

Nux Vomica—Presence of Copper in the Seeds.—Having determined the presence of copper in a sample of tincture of nux vomica, J. Rutherford Hill examined a number of other samples of tincture made by different manufacturers, and also some liquid extracts, and in each instance was able to establish the presence of copper in them. Having been assured that in the instance of one of the liquid extracts the material had in no stage of the process or subsequent preservation come in contact with copper utensils, the author examined some tinctures made by himself from powdered seeds, as well as some of the powdered seeds used for the products previously examined and supplied by this manufacturer for this examination. He found copper in every instance, in one instance to the amount of 7.34 per cent. of the ash, corresponding to 0.24 per cent. in the original powder. Finally, the experiments were extended to two commercial samples of whole seeds, one grey colored and the other greenish, and copper was found in both instances, the quantity being apparently greater in the greenish than in the grey seeds (See also *Tincture of Nux Vomica*, under "Pharmacy").—Pharm. Journ., April 21, 1900, 417.

Durah Bark—Alkaloidal Constituents.—S. A. Camphius has subjected the finely fibrous brown bark of

Strychnos Guyanensis, known as "durali bark," to chemical and physiological examination and experiment. The result of these experiments, which are of a preliminary character, point out that the bark contains two or more alkaloids, having a very bitter taste, apparently capable of forming crystallizable salts with hydrochloric and acetic acid, and possessing toxic action similar to that which characterizes the alkaloids of other members of the genus *Strychnos*. — Apoth. Ztg., Sept. 16, 1899, 552; from Nederl. Tijdschr. voor Phar. Chem. et Toxicol., Sept., 1899.

Gelsemium Sempervirens—Structure and development of the Internal Phloem.—Caroline B. Thompson communicates the results of a comprehensive histological study of the stem and root of *Gelsemium sempervirens* during different periods of growth, with the view to determine the structure and development of the internal phloem. The results are summarized as follows: (1) The internal phloem arises primarily as four longitudinal strands, which are an integral part of the leaf trace bundles. (2) The origin of the internal phloem is simultaneous with, or slightly later than, the protoxylem and external phloem, so that the leaf trace bundles are bicollateral from the first. (3) The internal phloem patches are bounded internally by a two-celled phloem sheath. (4) The internal phloem patches grow centrifugally by means of a medullary cambium, the inner and older layer in time becoming crushed and obliterated. (5) Death of the pith occurs early in the first year. (6) The continued disintegration of the pith and growth of the internal phloem results in the filling up of the pith cavity with the latter. (7) The internal phloem, which runs into the petiole, constitutes there at first a bicollateral bundle system, but

at the base of the petiole it descends through the xylem as two strands, and from this point upward the primitive collateral bundle system prevails. (8) No internal phloem is present in the root. (9) A copious fungoid growth is found in the cortex of the root. Absorption of starch usually results in cells inhabited by the fungus. (10) No internal phloem is present in the lower portion of the hypocotyl, nor in the cotyledons. (11) Two of the internal phloem patches of the stem arise just below the cotyledonary node, the other two just below the node bearing the first pair of leaves. (12) Internal phloem is an acquired characteristic of the plant and has probably been developed in these long and at times twisted stems, to supplement the external phloem. The histological characteristics here spoken of are exhibited in a number of cuts illustrating the author's paper.—Amer. Jour. Pharm., Sept., 1899, 422–433.

Strophanthus Kombe—Importance of Obtaining the Seed in the Pods.—Dr. E. M. Holmes has at different times called attention to the difficulty of obtaining strophanthus seeds in an unmixed condition, the importations of seeds designated as "Strophanthus kombe" being often the seeds of several species. He has recently received specimens of the plants, the seeds of which reach the European markets in admixture, and has also received some of the pods intact. These consist of *Strophanthus emini, S. kombe* and *S. courmonti*. At his suggestion, Mr. F. M. Moir, of the African Lake Corporation, has made arrangements in Africa to ship hereafter only the genuine *Strophanthus kombe*, which will be under the mark "Mandala Brand," and only in pods. In this form it is quite possible to identify the seeds by selecting a single one from the pod, whereas in the case of the mixed seed this is a matter of obvious impossibility.—Pharm. Journ., July 8, 1899, 34.

Kickxia Africana—Transfer to a New Genus, etc.—In 1895 specimens of an indiarubber plant sent from Lagos to Kew were identified as *Kickxia africana* (see Proceedings, 1896, 572), but recently better materials have been received from Lagos, and these show that the specimens previously received did not belong to one plant, but to two nearly allied species, one of which yields excellent india-rubber and the other does not, the evaporated juice of the latter yielding a sticky substance more nearly approaching gutta-percha than india-rubber. At a recent meeting of the Linnean Society, Dr. Stapf, of the Kew Herbarium, exhibited and described specimens of these two plants, and showed that they must be placed in a new genus, which he named *Fantumia*, after one of the native names of the rubber. The one yielding india-rubber he has named

Fantumia Elastica. This, when in fruit, is recognized by its short stout pod, and when in flower by its petals being ovate and shorter than the tube of the corolla, and when in leaf alone by minute oblong depressions

at the base of the lateral veins on the under surface of the leaf. The other plant, which does not yield india-rubber, he has named

Fantumia africana (this being the old *Kickxia africana*). It is distinguished by its flowers having petals of a linear-lanceolate shape, three or more times longer than the tube of the corolla, a long narrow angular pod, and leaves without the minute oblong depressions on their under surface. There are other characters distinguishing them, and the genus *Fantumia* from the genus *Kickxia*, which latter will now be confined to the Asiatic species. A full account of these characters will shortly be published by the Kew authorities.—Pharm. Journ., Dec. 16, 1899, 577.

Mascarenhasia Velutina—A Source of Caoutchouc in Madagascar.—Jumelle states that the tree employed frequently in Madagascar for the production of caoutchouc, and known by the name of "Guidroa," is a species of *mascarenhasia*, which he has named *M. velutina* because of the felty covering on the petioles and venation of the leaves. During the dry season the natives collect the latex by making numerous incisions into the stems (having a diameter of 15–20 Cm.) of the trees, which are from 5 to 6 Mm. in height, the thick-flowing milk coagulating almost immediately so as to form small bands of rubber, which are removed after an hour and formed into balls; a single man collecting in this way easily 1 kilo of rubber per day. The tree occurs in the dry forests of Western Madagascar. It is interesting to note in this connection that according to K. Schumann the rubber-yielding tree of the East African coast, known as "Mgoa," and supplying part of the Zanzibar caoutchouc, is also a *mascarenhasia*, which has been known botanically as *M. elastica*, Schum. Furthermore, Baker states that *mascarenhasia utilis*, a tree known by the name of "Ramiranja" in Madagascar, also is capable of yielding caoutchouc. But this substance appears to be most abundant in the first-mentioned species, *M. velutina*, the scaly bark of which is so abundantly permeated with the latex, that when it is broken and the two fractures are carefully drawn asunder, numerous threads of rubber are drawn out, which are so elastic as to cause the two pieces to be drawn towards each other when allowed to lay at rest.—Pharm. Ztg., Sept. 30, 1899, 694; from Compt. rend, 128, No. 22, 1349.

Hancoria Specisa, Gomez—*Source of Mangabeira Caoutchouc.*—The "Kew Bulletin" (Sept. and Oct., 1899, 185), gives some detailed information concerning the distribution of *Hancoria specisa*, Gomez, the tree from which the "Mangabeira caoutchouc" is derived, as well as the method employed in collecting and preparing the latter for export. The tree is found in the so-called campos cerrados of the Brazilian provinces of Pernambuco, Bahia, Goyas, Minas, Geraes, Motto Grosso, and Sao Paolo; but caoutchouc is collected chiefly in the provinces of Bahia and Pernambuco, notwithstanding that the tree is abundant in some of the other provinces

named. The tree attains a height usually of 16 to 23 feet, although in Sao Paolo only of 12 feet, and the circumference of the crown often exceeds its height. It bears an edible plum-like fruit, which is valued and consumed largely by the natives, who prepare preserves and beverages from it. The trees are tapped when 5 or 6 years old, either by spiral incisions, or by cutting into the bark at certain intervals, the juice being collected into earthen vessels, the duration of flow being about a quarter of an hour with a yield of about 2 pounds, though in isolated instances as much as 11 pounds has been obtained from a tree at a single tapping. The latex has a tinge of rose color, which it communicates in some degree to the "biscuits" into which the coagulum is formed. This is accomplished by mixing the latex in a larger vessel with alum, which coagulates it in the course of 2 or 3 minutes. The coagulum is then expressed with the hands and drained by hanging it up on sticks exposed to the sun; whereupon it is formed into the cakes which characterize this variety of caoutchouc. It always retains some moisture, and frequently also considerable quantities of alum, causing considerable loss and making it less valuable than Para caoutchouc, which in other respects it equals.—Pharm. Ztg., Dec. 16, 1899, 894.

STYRACEÆ.

Storax—A Pathological Product Incited by Wounds on the Wood or Bark.—In his investigation of the origin and development of storax, J. Moeller has determined that this balsam is not produced in the bark, but is formed in the wood; and that this is not a physiological secretion, but a pathological product which arises after damage to bark or wood. The first effect of a wound is the development of schizogenous glands, which are subsequently converted into lysigenous spaces. These facts were verified both for storax from *Liquidambar orientalis*, and for sweet gum from *Liquidambar styraciflua*. In both the balsam does not exist in the normal plant, but was found only after the tree was wounded. Circular cuts were made in a tree of *Liquidambar styraciflua* six meters high. When the branches were not wounded there was no trace of balsam, but when the damage had affected the cambium, rows of balsam glands could be detected with a lens. There seems, therefore, no doubt that storax is a pathological product.—Pharm. Journ., Aug. 5, 1899, 139; from Centralbl. f. Bakt. u. Parsitenkunde, 5, 412.

Storax—Characterization.—Dr. Karl Dieterich communicates the results of numerous experiments made to place the methods for determining the quality of storax upon a scientifically correct basis. He finds that the greater part of the storax of commerce fails to respond in its characters to those of the natural drug, and proposes in some detail a method of examination to determine the following essential characters for the crude drug:

1. Water content: not to exceed 30 per cent.

2. Ash: not above 1 per cent.
3. Alcohol soluble portion: not less than 60 per cent.
4. Portion insoluble in alcohol: not more than 3 per cent.
5. Acid number: 55 to 75.
6. Ester number: 35 to 75.
7. Saponification number: 100 to 140.

The author has also experimented with various methods for purifying crude storax, using alcohol, ether, benzin and benzene as solvents. The largest yield was obtained with ether, the smallest with benzin. He proposes the following limits, based upon the average of normal samples and commercial sorts, for purified storax:

1. Water: at most 15 per cent.
2. Ash: at most 0.5 per cent.
3. Acid number: 70 to 90.
4. Ester number: 50 to 120.
5. Saponification number: 135 to 185.

—Apoth. Ztg., July 29, 1899, 449.

ERICINEÆ.

Calluna Vulgaris—Quercetin its Coloring Matter.—According to A. G. Perkin and F. G. Newbury the coloring matter of heather, *Calluna vulgaris*, is quercetin. A catechutannin is also present in small quantity.—Pharm. Journ., July 8, 1899, 25; from Proc. Chem. Soc., *15*, 179.

COMPOSITÆ.

Arnica Root—Sophistication.—Rodney H. True reports on the examination of several samples of arnica root by W. S. Ferris, which had aroused suspicion by reason of their heterogeneous appearance. Examined under the microscope, four forms contained resin reservoirs, but they differed in their number, size and position: the extent of woody development also varied greatly. Two forms were entirely devoid of resin reservoirs, and doubtless from plants not closely related to the arnica. In the lot examined, a type agreeing in many ways with the genuine article, but differing in having a very much greater development of wood and narrow medullary rays, was found. This appearance was never observed in specimens plainly genuine. Other specimens received from wholesalers under the name of arnica or Vermont arnica were found to have the same mixed character as the preceding. It is doubtful if *Arnica montana* was present in any of the specimens examined.—Pharm. Review, Aug. 1899, 348–349.

Taraxacum Root—Method of Assay.—Prof. L. E. Sayre, in connection with his criticisms and observations on the official extract of taraxacum (which see under "Pharmacy"), proposes the following method for the assay of taraxacum root: The fresh root, after drying in a current of air, a a low temperature, is reduced to powder and extracted as follows:

(*a*) *Taraxacin and Resin.* — Ten grams of the very finely powdered root are introduced into an extraction apparatus and percolated, by continuous displacement with chloroform, for eight hours. The chloroform solution, after the evaporation of the chloroform to a syrupy condition, is first treated with alcohol and filtered. The alcoholic solution is then concentrated, and treated with distilled water. The resin is thus separated and estimated as such. The part held in solution in water is evaporated in vacuo to dryness and weighed. This is estimated as crude taraxacin.

(*b*) *Reducing Sugars.*—The residue (dregs) from (*a*) are then treated with alcohol in a continuous extraction apparatus for eight hours, the alcohol evaporated, the resulting extractive treated with water, and the solution quantitatively estimated for sugar by Fehling's Solution.

(*c*) *Inulin.* — The residue (dregs) from (*b*) is now treated with hot water until exhausted; the aqueous solution concentrated and to the resulting evaporate is added three volumes of alcohol. The crude inulin is collected on a filter, dried at 100° C. and weighed.

(*d*) *Levulin.* — The alcoholic filtrate from the inulin is evaporated to drive off the alcohol, and the dense residue dissolved in water. The solution, acidulated with hydrochloric acid, is heated for six hours, thus converting the levulin into reducing sugar. The sugar is estimated by Fehling's Solution and calculated into levulin, using 0.9 as a factor.

To show how the root may vary with the character of the soil in which it is grown, the following analysis of root grown in June will illustrate:

	From low ground.	From high ground.
Moisture (in dry root)	9.79	9.48
Taraxacin	0.612	0.720
Inulin	9.34	4.83
Reducing sugars	12.50	2.60
Levulin	1.728	16.00

From results obtained by numerous determinations made during the past few years, the author feels warranted in stating that the average composition of the fresh root in local soil in the fall season is about as follows:

Moisture	79.165
Taraxacin	0.126
Reducing sugar	0.7802
Inulin	2.576
Levulin	1.2681

—Drugg. Circ., May, 1900, 90.

Insect Flowers—Cultivation in Algeria.—It is stated in "Revue des cultures coloniales" (*41*, 315) that the cultivation of the pyrethrum plant (the exact species is not given) has been attended with encouraging results at the botanical station of Rouiba, in Algeria. Trial cultivations

have been made with the white pyrethrum of Dalmatia, a plant that is more vigorous and more prolific in flowers than the Caucasian or the Persian varieties. At the present day, two-thirds of the insect powder obtained from pyrethrum that is used in Europe is produced in Dalmatia. The plant requires a clayey-sandy soil, somewhat light; it can withstand drought. It is right to irrigate only in case of extreme dryness of the soil. In Algeria it is necessary to sow in the nursery from the beginning of autumn, and to transplant in the spring. The plantation is arranged so that the plants form rows one meter apart; each plant is separated from the next by a distance of fifty centimeters. The plant flowers in May, and is harvested in the course of the summer. Six to eight hundredweights of dried flowers are gathered per hectare.—Pharm. Journ., Dec. 9, 1899, 549.

Brachycladus Stuckerti—A New Drug from Argentinia.—In "Merck's Annual Report" (1899) attention is directed to a new drug from Argentinia, which consists of the herb and root of *Brachycladus Stuckerti*. It is used by the natives, in the form of tea made from the entire plant, with extraordinary success in the treatment of the ailment incident to high altitudes, known as "Puna Soracho," and has been used with success in the relief of asthmatic attacks in this form, as also in the form of cigarettes, which are used like those usually prepared from *Cannabis Indica*. Though not as active as the latter, the cigarettes, which give off a pleasant odor, are devoid of the irritant effects sometimes experienced when the smoke from *Cannabis Indica* is inhaled. Prolonged use of the Brachycladus cigarettes induces sleep, followed by an oppression in the head, but the asthmatic attacks are frequently intercepted for days.—Pharm. Ztg., March 10, 1900, 191.

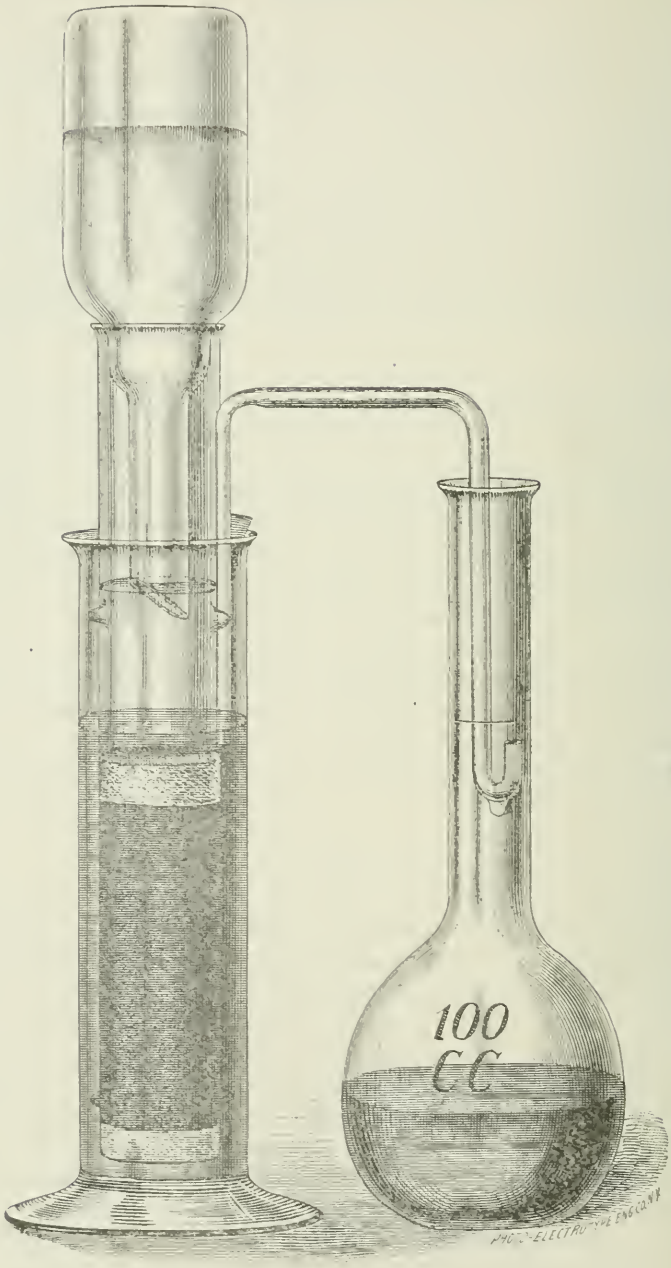
RUBIACEÆ.

Cinchona—Cultivation in Java.—The "Deutsche Kolonialbl." gives some interesting information concerning the cultivation of cinchona in Java, which is briefly as follows: The very fine seed is spread broadcast upon well shaded beds, in which the young plants shoot up and develop rapidly. When about hand-high, the little plants are transplanted to the less shaded nursery, where they remain two years, and are then set out in close rows. After three years the first weeding out of less vigorous plants takes place, this being done by uprooting in the case of *Cinchona Ledgeriana*, until eventually only the most vigorous trees remain, while the uprooted plants, as well as the lower branches removed from the remaining, are utilized for merchantable bark. In the case of *Cinchona succirubra* the uprooted plants are transplanted, since the young plants do not yield a merchantable bark. They grow rapidly and straight, and do not exhibit the tendency of the *Ledgeriana* to become many-branched and contorted. After eight years the *Succirubra* is a large handsome tree, when

it is felled as near as possible to the roots, the latter being allowed to remain in the ground. The bark is removed by treating the trunks and branches of the felled trees, when it becomes loosened, and is readily removed. It is dried preliminarily in the sun, on movable trays to facilitate their return to cover, and finally in a stove at a temperature of 120° C.—Apoth. Ztg., Oct. 7, 1899, 601.

Cinchona—Assay by the Aid of Acetic Acid.—In the course of his investigation on acetic acid as a substitute for ethyl alcohol in extracting the active principles of some official drugs (see "*Acetic Fluid Extract of Cinchona*," under Pharmacy), Dr. Edward R. Squibb recommends a process for the assay of cinchona, which is based upon the thoroughness with which that drug is extracted with acetic acid. Under the usual conditions of extraction the cinchona should be in fine powder—the U. S. P. directing No. 80 or finer powder for its assay process; but by the use of 10 per cent. acetic acid as menstruum, complete exhaustion is easily obtained with a powder as coarse as No 9. The apparatus and management are, however, of great importance in obtaining complete exhaustion. The form of apparatus used and recommended is shown by Fig. 61 in operation, and is simply a modification of the author's well-known syphon percolator originally described by him in 1872 (see Proceedings 1872, 182–192). The flattened end of the test-tube has five small holes that cannot be shown, and a small rubber band is better to hold the syphon in place than the wedge shown. The apparatus is easily made up from laboratory materials by any fairly expert glass-worker, but may be had from Greiner, Brooklyn. By the use of this apparatus the whole mass of powder is kept completely filled with menstruum, from first to last, the inner or extracting liquid being counterbalanced by the outer liquid that has already passed through the saturated powder. The syphon draws off the liquid from near the surface of this outer column at a rate controlled by the depth to which the end is immersed, and by the head of menstruum supplied—automatically—to the powder from the inverted bottle. The rate of percolation can thus be regulated to such slowess that friction is reduced to a minimum, and solution of the soluble particles effected with the least obstruction from the insoluble parts. Indeed, if the descent of the menstruum could be made so slow as to eliminate friction completely, then each stratum of solvent liquid would descend as a piston and complete exhaustion would be attained with the smallest quantity of solvent. In practice, 10 Gm. of the powdered cinchona in a capacious capsule is moistened with 10 Cc. of 10 per cent. acetic acid, the lumps all well broken up, the moist powder packed firmly in the percolator and percolated to complete exhaustion with 10 per cent. acetic acid. With the apparatus here described about thirty-six hours will be required, and the percolate will measure 180 to 200 Cc. The degree of exhaustion is judged by the degree of bitterness of the final percolate, which is not quite bitter-free when the cotton and the

FIG. 61.



lower part of the powder are quite bitter-free though not tasteless. The entire percolate is evaporated in a flat-bottom capsule to the condition of

a soft solid when cold, capable of being stirred when hot, the extract usually weighing from 35 to 38 per cent. of the cinchona, and retaining a small amount of acetic acid. The author gives minute and detailed directions for the further treatment—that is to say, the actual determination of the alkaloid in this extract—for which reference must be had to the original paper. Some of the advantages claimed for this assay process are: (1) The complete and easy exhaustion of cinchona, even when in coarse powder, by 10 per cent. acetic acid. (2) The success of the shaking out without emulsion by the use of large quantities of chloroform and very little water; and (3) by the control of loss by having all the residues bitter-free before they are thrown away.—Amer. Journ. Pharm., July, 1899, 312–320.

Cinchona—Defects of the Official Assay Process and Improvement.—Raymond High finds: (1) That in the official assay of cinchona the prescribed menstruum is insufficient for complete exhaustion; (2) an aliquot part of the extract is not literally or theoretically exact: (3) the prescribed amount of ammonia water is insufficient for most cinchonas; (4) there is a tendency to emulsionize: and that there are other defects, which are overcome in the following process: Take 10 Gm. of No. 50 powder, mix thoroughly with 15 Cc. NH_4OH, 10 per cent., and afterward with 5 Cc. C_2H_5OH, rubbing down all lumps. The capsule containing the mixture is covered for at least four hours. At the expiration of this time, the moist powder is introduced into the cone of a Soxhlet apparatus: 75 Cc. of alcohol are poured into the flask, and 50 Cc. of the same poured on the cone. The apparatus is then connected with the condenser and moderate heat applied: extract for five hours; evaporate the alcoholic extract to dryness; add 30 Cc. 2.5 per cent. H_2SO_4, and heat on a water-bath until quite hot, making up any loss with water. Filter through a pleated filter into a 250 Cc. separator, taking care to keep back the fine resinous particles by means of a glass rod: repeat this operation with portions of 10 Cc. each until the liquid in the capsule gives no reaction with Mayer's reagent. Wash the resinous matter on the filter by pouring over it H_2SO_4, 2.5 per cent., drop by drop, until the washings cease to give an alkaloidal reaction: 30 Cc. of chloroform are then added to the contents of the separator, and the whole shaken vigorously for 5 minutes. Now add slowly sodium hydrate solution, 15 per cent., and rotate the separator gently as the precipitate forms. The operation is repeated after each addition of sodium hydrate solution until it becomes slightly alkaline to litmus. The now saturated chloroformic solution is drawn off into another separator and extraction repeated with portions of chloroform, 2 parts, ether, 1 part, using 20 Cc. in each. The second and following extractions may be well shaken, as the liquid separates slowly. After extracting until the liquid ceases to react with Mayer's reagent either in chloroformic or aqueous solutions, the combined chloroformic solutions are filtered into a tared flask, and the separator rinsed with chloroform, 10 Cc. Now evaporate on a water-bath

and dry to constant weight. The difference between the combined weight of flask and alkaloid and that of flask multiplied by 10 gives the percentage of total alkaloids.

Quinine is estimated by taking up the total alkaloids in chloroform and following the U. S. P. method, except to use ether, 20 Cc., for each solution, A and B.

Fluid extracts are assayed by evaporating 10 Cc. to dryness and proceeding from the corresponding point in assay proper; while of solid or powdered extracts, only 2 Gm. are assayed under the same conditions, using 30 Cc. H_2SO_4, 2.5 per cent., to dissolve them.—Amer. Drugg., Dec. 26, 1899, 354.

False Ipecacuanha—New Varieties.—C. Hartwich describes a number of new varieties of false ipecacuanha recently received from Dr. Hinneberg, of Altona. One of these was the root of

Psychotria Emetica, Mutis. A second resembled this root very closely; the roots were slightly thinner, of a black-brown color, longitudinally furrowed, sparsely constricted, gray-violet in transverse section, wood yellowish and of normal structure, the bark containing numerous raphide bundles. It is probable that this sample is derived from a *psychotria* identical with an old sample in the Swiss Polytechnicum, in Zurich, designated as "Ipecacuanha Nigra." A third sample was derived from

Jonidium Ipecacuanha, St. Hilaire (Violaceæ), which is known as "Ipecacuanha alba lignosa." This is composed almost exclusively of leafy stems and very few roots. A fourth sample consisted of pieces of a root, 4 to 8 Mm. in thickness, gray-brown externally, reddish-yellowish internally. The surface is flatly furrowed transversely, but so sharply striated longitudinally as to partially obliterate the transverse depressions. The wood amounted to ⅓–½ the diameter, but pieces were found in which the ligneous portion was smaller. The bark was broken off in occasional sections from the ligneous core as in the case of genuine ipecacuanha. Under the lens a normal ligneous portion with relatively large vessels was revealed, and in the bark aggregations of inulin and glands containing calcium oxalate. The presence of inulin points to a violacea as the source of the root: *jonidium ipecacuanha*, however, has stone cells and no glands, contains octahedral and prismatic single crystals, and the vessels are very much smaller than those of the sample under discussion. It is not improbable that the sample is derived from *jonidium microphyllum*, H. B. K. but owing to the lack of material this could not be definitely determined.—Schweiz. Wochenschr. f. Ch. u. Ph. 1899, 521.

Jahore Ipecacuanha—Alkaloidal Value.—John C. Umney and Ralph S. Swinton have had opportunity to inquire into the alkaloidal value of a quantity of ipecacuanha from Jahore (Straits Settlements), recently imported. The root is with little doubt derived from

Psychotria Ipecacuanha, the species that yields the Brazilian root, and differs but little from the latter, except that the present shipment is practi-

cally free from stems, and that the annulations are more prominent. Following the process of Paul and Cownley (see Proceedings, 1896, 579), which consists in extracting the total alkaloids with amylic alcohol, and determining the proportion of cephæline and emetine by taking advantage of the solubility of the former in soda solution, the authors obtained the following mean results of three experiments:

		Percentage proportion.
Emetine	1.24 per cent.	72.94
Cephæline	0.39 "	22.94
3d alkaloid or other alkaloids	0.07 "	4.12

These results point to the conclusion that Jahore ipecacuanha root corresponds most closely with the official Brazilian variety, and there appears no reason why it should not be used in medicine for standard preparations of ipecacuanha, unless it be found that the third alkaloid differs materially from that in Brazilian roots.—Trans. Br. Phar. Conf., 1899, 348–350.

Ipecac—Alkaloidal Value and Method of Assay.—Cæsar and Loretz (Geschäftsbericht, Sept., 1899) report the results of the assay of nine lots of Rio ipecac and twenty-two lots of Carthagena ipecac. Rio ipecac varied from 2.00 to 3.14 per cent. of emetine, with an average of 2.60 per cent.; Carthagena ipecac ranged from 1.80 to 3.46 per cent. of alkaloid, the average being 2.77 per cent. The process employed for these assays is a modification of Keller's, in which ether is substituted for ether-chloroform, and this substitution is strongly recommended as most useful. While the figures obtained both volumetrically and gravimetrically agree well, it is contended that the gravimetric method is more suitable than the volumetric method officially directed, since not every pharmacist possesses correctly standardized solutions. Indeed, it is suggested that the extremely simple process of the Japanese pharmacopœia is all sufficient. This requires at least 2.5 per cent. of alkaloid in ipecac, and is carried out as follows:

Upon 3 Gm. of powdered ipecac, contained in a flask, 50 Cc. of alcohol are poured, and the flask with contents is weighed. The flask is then connected with a reflux condenser, the heat of a water-bath is applied for two hours, and the original weight restored after cooling by the addition of alcohol. Then 25 Cc. of the filtrate are evaporated to dryness, the residue taken up with about 10 Cc. dilute (1:9) sulphuric acid, 2 Cc. of Mayer's Solution added, and thoroughly shaken. When filtered, this filtrate must become turbid on the addition of more Mayer's reagent.—Pharm. Review, Nov., 1899, 521.

Coffee—Analytical Results with Various Sorts.—W. L. A. Warnier has had opportunity to examine a large number of coffees in the laboratory of the Colonial Museum at Haarlem, conducting his researches with particular reference to the Liberia coffee cultivated in Java as a substitute for Arabian coffee. The results are shown in the following tables:

Sample of Coffee.	Aqueous Extr. per cent.	Alcoholic Extr. per cent.	Fat, per cent.	Caffeine, per cent.	Ash, per cent.	Phosphoric Acid in Ash, per cent.	Potash in Ash, per cent.
Sindjas	32.92	17.43	12.26	1.29	3.87	8.05	72.05
Timor	32.05	16.60	13.23	1.11	3.96	7.87	78.78
Banthain	30.38	18.89	14.78	1.11	4.29	10.26	77.83
Boenger	31.09	18.41	16.10	1.03	3.88	12.37	71.47
Loewæ	30.13	17.82	16.06	1.48	4.30	11.25	79.90
Waloe Pengenten	26.98	17.85	13.57	1.25	3.97	9.47	76.91
Kaui Redjo	29.59	18.89	15.43	1.00	3.74	10.67	?—Rep.
Taman. Tjiasem	30.47	19.91	16.48	1.39	4.09	10.27	67.57
Malang	30.21	19.81	16.36	1.07	4.11	11.08	63.82
Average	30.0	.....	15.0	1.00	4.00		

The *water extract* was obtained by boiling 5 minutes with distilled water; the *alcohol extract* by boiling during half an hour with 95 per cent. alcohol; the *fat* by extraction with ether: the alkaloid by one of three methods, viz., van Romburgh's, van Ledden-Hulseboch's and George's, preference being given to van Romburgh's method, which consists in shaking out the aqueous extraction, after addition of lead acetate, with chloroform.

In the following table a comparision is made of two sorts, Java-Arabia and Java-Liberia, both in the raw and roasted condition. The extracts, unless otherwise indicated, are (evidently, Rep.) obtained by the action of each solvent on fresh portions of the same coffee. The coffees represent good qualities of the market during 1898.

	Raw Malang.	Roasted Malang.	Raw Liberia.	Roasted Liberia.
Aqueous extract	33.52	27.40	35.16	34.17
Alcoholic extract	19.38	16.12	18.62	17.27
Ether-alcoholic extract	17.70	16.53	15.80	15.92
Chloroform extract	15.65	17.91	13.88	15.10
Ether extract	13.63	14.20	12.19	13.13
Petroleum ether extract	12.51	14.31	10.84	11.68
Ether extract after petroleum ether	1.08	4.74	0.75	3.14
Chloroform extract after petroleum ether	1.08	1.41	1.18	2.60
Alcohol extract after petroleum ether	3.14	5.37	8.68	2.79
Nitrogen	2.83	2.77	2.73	2.89
Caffeine	1.16	1.57	1.59	2.19
Albuminoids	15.74	14.71	14.43	14.42
Cellulose	28.75	20.47	26.68	15.32
Pentoses	5.14	3.15	5.01	2.44
Ash	4.46	4.83	4.02	4.37
Water	11.24	5.64	11.40	3.98

—Apoth. Ztg., Aug. 16, 1899, 485; from Phar. Weekblad. von Nederl. 1899, No. 13.

Coto Barks—New Varieties—C. Hartwich describes two new varieties of so-called "coto bark." The one obtained from Brazil is distinguished from Bolivian coto bark in containing an alkaloid, but neither cotoine or paracotoine. It is derived from a Lauraceæ,

Cryptocarpa pretiosa, and is employed both as a spice and in medicine under the local name of "casca pretiosa." Its use is said to be liable to produce vertigo. The second new variety of coto bark has frequently found its way to European markets as a variety of cinchona bark. It is identical with the tanning bark described by Moeller under the name of "curdidor," and bears close resemblance to the bark found as an admixture of Carthagena bark by Vogl, and designated by him as China Trujillo and Huanuco-China. The precise source of these barks is not known; they are supposed to be derived from a Sapotaceæ.—Apoth. Ztg., Dec. 16, 1899, 758; from Schweiz. Wochenschr f. Ch. u. Ph., 1899, 310 and 519.

CAPRIFOLIACEÆ.

Ivy—Glucosidal Constituents.—Houdas has isolated several glucosides from ivy. One of these is

Hederin, $C_{64}H_{104}O_{19}$, which crystallizes from 90 per cent. alcohol in fine long radiating needles. It is insoluble in water and in chloroform, very sparingly soluble in ether, but soluble both in alcohol and in acetone, the alcoholic solution being dextro-rotatory. When heated the crystals lose 6.2 per cent. of their weight on prolonged exposure to 130° C., and they melt at 248° C. By boiling in dilute sulphuric acid for 12 hours it is hydrolyzed, with formation of

Hederidin, $C_{26}H_{40}O_4$, and two sugars, hederose, $C_6H_{12}O_6$, and rhamnose, $C_6H_{12}O_5$. Hederidin crystallizes from boiling alcohol in brilliant rhomboidal crystals, which melt at 324° C., sublime at a higher temperature without decomposition, and are insoluble in water, ether, benzene, or chloroform.—Pharm. Journ., July 15, 1899, 45; from Compt. rend *128*, 1463.

Catha Edulis—Proximate Constituents.—In a paper read before the Convention of German Naturalists and Physicians (Sept. 20, 1899), Prof. Schaer communicated the results of a chemical examination of the leaves and seeds of *Catha edulis*, undertaken by him in conjunction with A. Beitter. The principal constituents of the leaves are: 1. A physiologically active alkaloid, cathine, which forms rhombic crystals. 2. Large quantities of caoutchouc. 3. A tannin, closely related to that of tea leaves. 4. Mannite. 5. Small quantities of an oxygenated volatile oil. From the seeds about 50 per cent. of fixed oil, composed of glycerin-esters, was obtained.—Apoth. Ztg., Sept. 27, 1899, 572.

UMBELLIFERÆ.

Fennel—Adulteration with Extracted Fruits.—Prof. Neuman-Wender, in continuation of previous investigations, has determined that in the

course of the past year not less than 50,000 Kg. of fennel seed deprived of oil have reached the markets of Germany from Sadagóra, while much larger quantities have been introduced from Skala, Czortkow and Krórolowska. The extracted fennel is of three kinds:

1. The residues after distillation in a current of steam. This kind is composed of small, deformed, black-brown grains, very friable and containing very little oil.

2. The residues after distillation with water. These are also brown, but present a better appearance.

3. The residues after distillation with spirits. In this case the fennel, enclosed in linen bags, is suspended in the apparatus, and partially deprived of oil by the alcohol vapor which traverses them. The fennel so treated is but slightly modified in appearance, and retains from 1 to 2 per cent. of oil, but possesses a decided odor of fusel oil derived from the crude spirit with which the oil has been extracted.

The extracted fennel is prepared for the market by coloring it with a variety of substances—chrome yellow, green iron ochre, the coloring matters of the fruit of *rhamnus infectoria* and quercitron bark, &c. The author finds that the recognition of extracted fennel by sinking in water, as suggested by Sendkner and Juckenack, is not practicable, since genuine fennel will likewise sink during the period prescribed by the test. He recommends that the suspected seeds be macerated in alcohol and rubbed in the hands to remove the coloring matter. By the aid of the magnifying glass the brown extracted fruits may then be picked out from among the genuine, and if they are then macerated during 24 hours in water, this will assume a dark brown color with extracted fruits, whereas the genuine fennel simply imparts a yellowish-green color to the water.—Apoth. Ztg., Nov. 18, 1899, 703; from Brit. Chem. Ztg., 1899, 588.

Asafetida—Percentages of Ash and Alcohol-Soluble Constituents.—John C. Umney, referring to the B. P. requirements that asafetida should contain not less han 65 per cent. of matter soluble in alcohol (90 per cent.), and should yield not more than 10 per cent. of ash when incinerated, observes that he had opportunity during the last eight years to examine many of the very finest packages of asafetida of trade, but in no instance could average samples of such cases be obtained complying with these requirements, although selected tears from various cases of the drug may do so. Experiments made show that the ash of selected tears of asafetida often falls as low as 4 per cent., but that the powder obtained from the whole case from which such tears were picked yielded no less than 16 or 17 per cent. of ash. In a recent examination of ten samples obtained in trade, three, consisting of picked tears, yielded 3.2, 4.8 and 5.77 per cent. of ash; one yielded 13.9 per cent.; one, composed of mixed tears and mass, being one of the finest procurable in the London market, yielded 21.5, and the others yielded 35.5, 44.1, 45.7, 57.8 and 62.2 per cent. of ash respectively. Five samples

of powdered asafetida yielded 21.5, 29.4, 31.3, 45.3 and 57.7 per cent. As to the percentage of matter soluble in alcohol of 90 per cent., the following are the proportions in nine samples, the figures obtained by difference: 79.8, 50.85, 51.5, 48.6, 48.4, 46.1, 29.7, 21.5 and 21.1 per cent. respectively. It is evident from the foregoing that the B. P. requirements are placed too high.—Chem. & Drugg., Dec. 16, 1899, 983.

Gum Resins—Percentage of Nitrogen in Different Sorts.—K. Kandelaki has determined the percentage of nitrogen contained in two samples of each of the following gum-resins: Ammoniac, 1.05 and 1.58; myrrh, 2.94 and 2.78; gamboge, 1.03 and 1.13; asafetida, 1.79 and 1.87; olibanum, 2.98 and 2.325 per cent. The nature of the nitrogenous compond will be subject of future examination. Qualitatively he determined the presence of nitrogen also in the following resins and products: Opoponax, Elaterium, Euphorbium, Eucalyptus resin, Podophyllin and Lactucarium.—Apoth. Ztg., June 16, 1900, 404; from Farmaz. Journ., 1900, 273.

Gum Resins—Structural Characters of Identity and Distinction.—Prof. J. Wiesner communicates the results of some interesting studies concerning the structure of the gum resins, particularly of gamboge, asafetida, ammoniac, galbanum, myrrh and olibanum. All the gums related to acacia or cherry gum in their properties are characterized by conchoidal fracture. Under the lens the surface of the fracture is distinctly seen to be radially fissured, the fissured lines being visible even on small splinters. If the gum of the gum resin is isolated, it exhibits the same fracture and fissure lines; but if the gum, as in the case of gamboge, is saturated with resin, these fissure lines may not be observed at all, or they do not present the sharply defined radially converging lines exhibited by gums free from resin. The characteristic lines, however, invariably manifest themselves in resin-free spots when they occur on a gum resin.

Gamboge is composed of a homogeneous hyaline gummy base, in which small globular resin-grains are uniformly and profusely imbedded. These resin-grains are so abundant that the fissure lines are but indistinctly visible. The resin-grains are particularly well recognized if splinters of the gum-resin are imbedded in oil, and among these an occasional monoclinic crystalline body may be recognized, the precise nature of which remains to be determined. Gum-resins of the same type are *ammoniac* and *galbanum*. In

Asafetida larger spaces are found which consist of gum alone. When imbedded in oil, these spaces remain unchanged and the fissure lines are easily recognized. Besides resin-grains, minute drops of oil are exhibited in the gum-like mass. *Olibanum* and *myrrh* belong to this type; in the case of Arabic olibanum the oil and resin-free spaces are particularly large.—Apoth. Ztg., Dec. 16, 1899, 759; from Ztschr. Oest. Apoth. Ver., 1899, 425.

Gum Resins—Analytical Values of Different Kinds.—Dr. K. Dieterich has determined the analytical constants in different commercial sorts of different gum-resins and resins. Omitting the special process, which must be consulted in the original, the following table exhibits the results obtained :

	Acid number.	Resin number.	Ester number.	Saponification number.
Ammoniac - African (from *Ferula tingitana*	69.29	103.89	.....	105.03
	51.56	104.59	.....	108.10
Galbanum	25 to 65	107 to 122	.....	116 to 136
Bdellium, African	12.79	.....	70.00	82.79
	14.43	.....	69.33	83.76
Bdellium, African	9.73	.....	96.39	106.02
	11.96	.....	95.57	107.53
Bdellium, African	19.21	.....	90.66	109.87
	20.81	.....	90.14	110.95
Bdellium, Indian	35.69	.....	46.75	82.44
	37.19	.....	48.46	85.65
Opoponax, from Burseraceæ	23.84	.....	83.01	105.85
	30.92	.....	97.24	128.16
Opoponax, from Burseraceæ	10.46	.....	85.74	96.20
	16.40	.....	81.94	98.34
Opoponax, from Burseraceæ	24.03	.....	125.01	149.04
	28.20	.....	124.62	152.82
Opoponax, from Umbelliferæ, Teheran, liquid	32.43	.....	105.46	137.89
	33.06	.....	119.58	152.64
Opoponax, from Umbelliferæ, Teheran, solid	35.00	.....	114.07	149.07
	36.86	.....	126.90	163.76
Opoponax, from Umbelliferæ, old.	53.40	.....	142.60	196.00
	58.57	.....	140.50	199.07
Sagapenum	13.96	.....	31.29	45.25
	14.81	.....	39.37	54.18

—Apoth. Ztg., Aug. 26, 1899, 509.

Opoponax—Constituents.—A. Knit has subjected opoponax to comprehensive chemical examination. The portion soluble in ether is composed of the ethers of ferulic acid of opo-resinotannol. The portion insoluble in ether contains free opo-resinotannol, volatile oil, free ferulic acid, vanillin, gum, and bassorin. The volatile oil yields a crystalline body, $C_{20}H_{10}O_7$, fusible at 133°–134° C., soluble in warm water, and having an acid reaction. The gum does not act on polarized light, and has a composition corresponding to the formula $C_8H_{14}O_7$. Opoponax is characterized by containing a resinotannol, the molecules of which contain 6 atoms of C of the same centesimal composition as that of Siam benzoin, and belongs to the group of resins which do not yield umbelliferone on distillation. The author has also analyzed

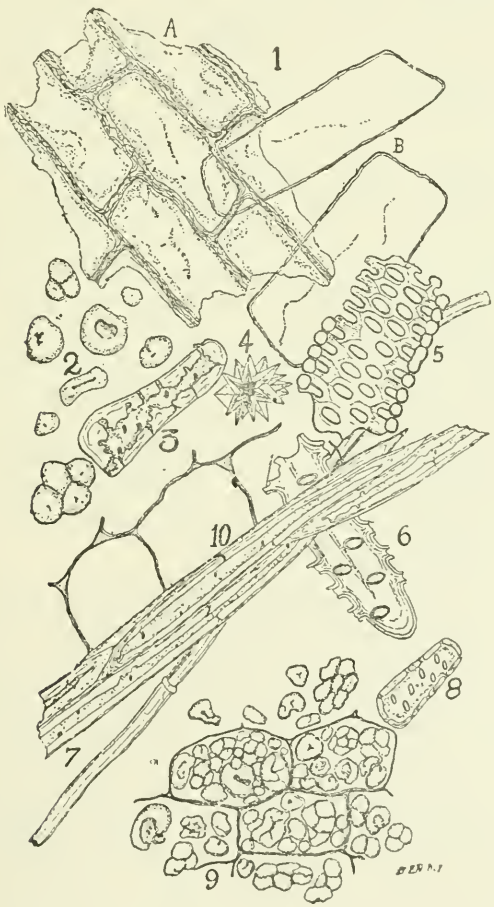
Galbanum, but has been unable to isolate the galbanic acid described by Hirschsohn. Like sumbul root, it yields umbelliferone on analysis.

Inasmuch as "galipot" readily yields galbanic acid, the author expresses the opinion that galbanum may contain the resin as an impurity.—Arch. d. Pharm., *237*, 256.

ARALIACEÆ.

Aralia Nudicaulis—Histological Elements of the Powdered Root.—Burt E. Nelson describes the microscopical features of the root of American sarsaparilla in transverse section, and points out the principal histological elements that are shown in the powder under the lens (in Fig. 62).

FIG. 62.



1, Cork cells: *a*, uncleared; *b*, cleared. 2, Starch Granules. 3, Short Schlereid. 4, Small Rosette of Calcium Oxalate. 5, Fragment of Pitted Vessel. 6, Fragment of Sieve Tube. 7, Bast Fiber. 8, Sieve Cell. 9, Cells filled with Starch, from the Middle Bark 10. Group of Bast-cells.

In this the pitted vessels, cork cells, and cells filled with starch granules from the middle bark, are especially numerous. The cork cells are seldom

found in a position showing their sectional shape, but flatwise, in which position they are usually either oblong or have one end beveled. The fineness of the powder will determine whether or not the vessels will be found in relation with one another or in separate fragments; the rosettes of calcium oxalate also are found broken in fine powders. Short schlereids and sieve tubes are less frequently seen. The starch granules are of all sizes, from very minute up to 8 or 10 microns, but individual granules average about 4 or 5 microns. Compound grains, or at least adhering simple grains, are more numerous than solitary ones; duets, trios and quartettes are most common, but rosettes of several are not rare. The tendency is toward a circular or oval outline; but unequal pressure and other causes frequently produce irregular forms. The hilum is visible in most of them, and this, too, is frequently irregular as to shape and size. Concentric markings are absent or ill-defined.—Merck's Rep., Oct. 1899, 441–442.

Aralia Nudicaulis—Proximate Examination with Special Reference to the Oil and Terpenes Contained in the Rhizome.—William C. Alpers subjected the rhizomes of *Aralia nudicaulis*, collected by him in the hilly woods of Bergen county, N. J., to exhaustive chemical examination. The fresh rhizomes, according to the age of the plant and time of collection, contained from 40 to 60 per cent. of moisture, and yielded on incineration from 5 to 6 per cent. of ash, calculated on the drug dried at 100° C. Subjected to systematic proximate analysis by Dragendorff's method, petroleum benzin extracted 1.726 per cent. from the dry drug, this extract being composed mainly of fixed oil, and from .04 to .12 per cent. of volatile oil. Anhydrous ether extracted 1.280 per cent., consisting of 1.237 per cent. of acid resin and .043 per cent. of indifferent resin. Absolute alcohol then extracted 1.931 per cent., mostly tannin, some acid resin, and probably an organic acid. The

Fixed Oil of Aralia nudicaulis, which in a previous investigation by the author and B. L. Murray (see Proceedings, 1897, 183–190) had been overlooked and classified as resin, is a perfectly clear, dark red fluid, soluble in petroleum benzin, benzene, ether and chloroform, sparingly soluble in absolute alcohol, and insoluble in alcohol or water. It has an acrid, pungent taste, slightly resembling castor oil, is thick-liquid at the ordinary temperature, solidifying at 3° C., and a sp. gr. of 0.921 at 20° C. It is non-drying, forms elaidin with nitrous acid, and is largely composed of triolein, $C_3H_5(C_{18}H_{33}O_2)_3$. Its constants are determined to be as follows: Acid number, 7.39; saponification number, 192; iodine number, 106. The

Volatile Oil of Aralia Nudicaulis, which was distilled for the author at the Lloyd Laboratory, Cincinnati, from two separate lots of 50 kilos each, carefully selected and identified by him, was obtained in quantities of 0.12

and 0.04 per cent. respectively. It had a peculiar aromatic odor, resembling young carrots, and was of a clear, light-yellow color. Subjected to fractionation and examination it was found to consist principally of a sesquiterpene and an alcohol, a small quantity of azulene being also present. The sesquiterpene, $C_{15}H_{24}$, differs in its reactions and properties from its isomers, and the author therefore proposes to name it

Araliene.—It has a sp. gr. of 0.9086 at 26°C.; boiling point, 270°C., $[a]_D = -7$ to -8; $N_D = 1.49936$. It forms oily compounds with HCl and Br, and derivatives with nitrous acid. Treated with hydrochloric-acetic acid it forms a compound of permanent blue color. Chloroform and sulphuric acid produce a purple red color, acetic acid and sulphuric acid a wine-red color.—Amer. Jour. Pharm., Aug., 1899, 370–378.

Ginseng—Cultivation in America.—B. L. Hart points out that there is not a crop that is produced from soil that will yield such large returns as ginseng if properly taken care of. On one acre from 130,000 to 150,000 roots can be grown, and there is always a good market for the drug. There are several growers throughout the country who are making a great success of it, and others should begin to grow it at once. The root is perfectly hardy in any part of the United States and Canada. It is a perennial, but the growth of the plant above ground is annual. It makes its appearance in New York State in the early part of May. The seedlings at first look something like sprouting beans, and have three leaves at the top of a stem rising one or two inches above ground. The third year's growth is much different from that of the first and second years. From the last week in April until the first week in May this plant will shoot up its stem, which is about the size of a pencil, and the whole stem will be from ten to fourteen inches high, with three branches and five leaves in a whorl on each branch. This makes on each plant about fifteen leaves, which somewhat resemble the horse chestnut. The two leaflets at the base of the branch are about two inches long, while the other three are from five to eight inches. A plant of this description will bear the seed in July. It produces a cluster of from fourteen to fifteen small, yellowish-green flowers in an umbel. These flowers are afterwards followed by fruits somewhat resembling flattened berries, green in color until near August, when they change to a bright scarlet and ripen in September, and produce from two to three seeds in each berry. The root consists of two portions, the root-stalk and the root proper, The former, not more than one-third of an inch in diameter, shows scars which indicate each year's growth. When young the roots resemble little parsnips, but as they grow older become more or less forked and darker in color. The cultivated roots usually weigh from one-half to three-quarters of a pound when from four to five years old, while some have reached the weight of one pound.—Pharm. Era, May 31, 1900, 581.

RANUNCULACEÆ.

Aconite—Assay by a Modification of Keller's Method.—A. R. L. Dohme finds it quite practicable to assay aconite root and leaves by a modification of Keller's method, which consists mainly in a slight variation in the proportion of the solvents used for the extraction of the drug, and avoiding all temperatures exceeding 50° C. throughout the assay. The proportion of ingredients of the assay were: For the root—drug, 12 grams; ether, 90 grams; chloroform, 30 grams; ammonia (0.96), 10 grams; water, 20 grams. For leaves — drug, 25 grams; ether, 100 grams; chloroform, 25 grams; ammonia (0.96), 10 grams; water, 50 grams. Filter off 100 grams or an aliquot portion by weight, each 10 grams in case of root, and each 5 grams in case of leaves representing 1 gram of drug. Extract with 5 per cent. sulphuric acid; make alkaline with ammonia and extract with a mixture of equal parts of chloroform and ether. Evaporate off the chloroform-ether at a temperature not exceeding 50° C., and if possible less, and titrate the residue with centinormal potassium hydroxide, after dissolving it in the cold with a definite amount of decinormal sulphuric acid. The residues in the assays presented the usual appearance of almost colorless varnish, with a tendency to crystallization, the results in duplicate assays of the same drug being as follows:

Aconite Root (*a*) 0.620 per cent. total alkaloids.
(*b*) 0.619 per cent. total alkaloids.
Aconite Leaf (*a*) 0.210 per cent. total alkaloids.
(*b*) 0.205 per cent. total alkaloids.

In other analyses the author has found as high as 0.96 per cent. of total alkaloid in aconite root and 0.54 per cent. in the leaves, and again as low as 0.24 per cent. in the root and 0.12 per cent. in the leaves The above results indicate a fair sample of root, but a rather low grade sample of aconite leaf. The reliability of the method has been proven to the author's satisfaction by chemical tests applied to the product obtained under the conditions of the assay after recrystallizing it, and he hopes to show that it is aconitine unimpaired in its physiological activity.—Drugg. Circ., April, 1900, 69.

Japanese Aconite Root—Investigation of Alkaloidal Constituents and Derivatives.—See *Japaconitine*, under "Organic Chemistry."

Hydrastis—Impurities and Adulterations.—Senft calls attention to a grossly adulterated (or impure?) sample of hydrastis, which appeared to contain an entire collection of substances that do not belong to it. Besides a variety of other roots, probably those noted in text-books, such as *Collinonia*, *Jeffersonia*, *Trollium* and *Stylophorum*, which are present only in small quantities, the sample contained considerable quantities of the root stock and rootlets of *Aristolochia serpentaria*, together with mosses—*Jungermannia* and *Hypnum*—spagate, clay, stones, fragments of seed

shells, and other undetermined substances.—Pharm. Post, Aug. 6, 1899, 427.

Delphinium Staphisagria—The True Plant Practically Unknown in England.—E. M. Holmes calls attention to the remarkable fact that the plant in the English botanic gardens hitherto considered to be *Delphinium Staphisagria* is in reality another species, namely,

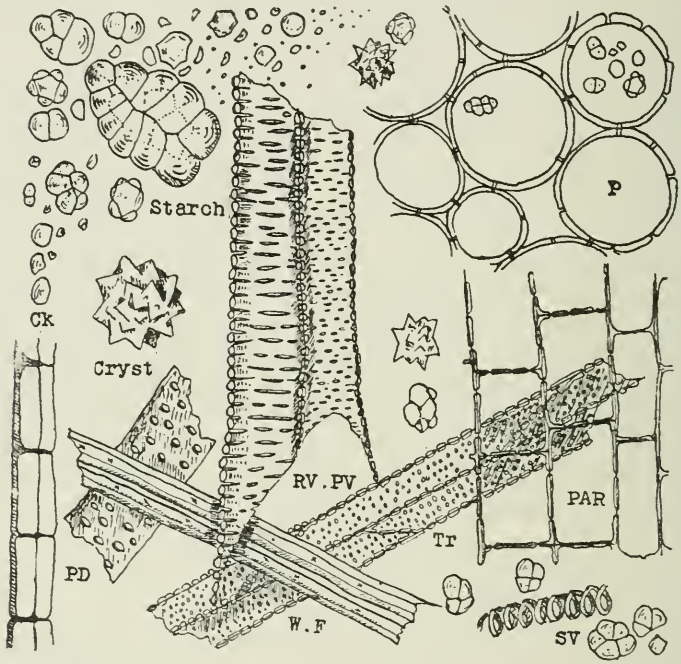
Delphinium Pictum, Willd.—The author accounts for the absence of the true plant in botanic gardens partly by the fact that it is only half-hardy in Great Britain, whilst *D. pictum* is hardy, and partly by the reason that the illustrations in several works on medicinal plants—even in Bentley and Triemen's "Medicinal Plants"—are incorrect or unreliable. The two species are distinguished as follows: *D. Staphisagria* has very hairy stems, glandular hairs being mixed with the long spreading soft hairs; flowers that when well-developed have an ultramarine blue tint; a calyx with very short or almost obsolete spur; carpels containing only four or five seeds. *D. pictum*, Willd., has shorter soft hairs, but no glandular hairs on the stems; the flowers are of a pale lilac color; the spur is as long as the calyx segments; each carpel contains ten or twelve seeds, and these are only half the size of those of *D. Staphisagria*. The true *D. Staphisagria* extends from Teneriffe around both the northern and southern coasts of the Mediterranean to Asia Minor. It is quite possible, therefore, that varieties having blossoms of different tints may occur. The evidence obtainable, however, goes to show that the form of the plant from which the seed of commerce is obtained—which, by the way, will not germinate, or only very rarely—has clear blue flowers. Though not certain, the author believes that the seeds of commerce are imported from the Adriatic *viâ* Trieste. The plant is spoken of by Camerarius as growing wild at Crepanum, in Illyria, but it is probably cultivated also.—Trans. Brit. Pharm. Conf., 1899, 390–395.

BERBERIDEÆ.

Podophyllum—Histological Characters of the Powdered Rhizome—Prof. Smyth Ely Jelliffe gives a description of the rhizome and rootlets of Podophyllum peltatum, illustrating his subject by cuts exhibiting the microscopic features of sections of the cortex and fibro-vascular bundles, and of the important microscopic elements of the powder, the latter being here represented in Fig. 63. The most conspicuous features of the powder are starch grains, crystals, vessels, parenchyma and fibers. Less conspicuous tissues found are sieve tubes, cork cells, tracheids and wood parenchyma. The starch is characteristic. In the fresh condition it is seen to consist of compound grains made up of from 5 to 20 granules. In dry specimens of the market, the grain is found to be broken up, and is apparently simpler in structure. The average diameter of the grains is from 8 to 14 mikra. The larger granules measure from 4 to 6 mikra.

The hilum is inconspicuous and concentric markings are few. The crystals are not very numerous, yet are large, well-marked rosettes. They average from 40 to 80 mikra, in several specimens examined. Reticu-

FIG. 63.



Podophyllum in Powder. — *Starch*; *Cryst*, crystals of calcium oxalate; *Ck*, corky tissue, side view; *PD*, duct with bordered pores; *RV*, *PV*, reticulated and pitted ducts; *Tr*, tracheids; *SV*, spiral vessel; *WF*, wood fibers or bast fibers; *Par*, parenchyma, in longitudinal view; *P*, parenchyma in cross section.

lated and pitted vessels are the most characteristic in the powder. Fragments measure about 40 to 100 mikra. The parenchyma, starch-filled, is thick-walled and pitted, and the cells average from 40 to 100 mikra. The fibers in old dried specimens colored yellow are not frequent, and offer no important differential characters. Corky tissue is frequent and typical; tracheids average about 25 mikra across. Here and there in a field in the powder of the dry drug, masses of resin-like material may be encountered. —Drugg. Circ., Sept., 1899, 196.

RUTACEÆ.

Pilocarpus Racemosus—A New Source of Pilocarpine.—Rocher calls attention to *Pilocarpus racemosus*, indigenous to the French Antilles, as a source of pilocarpine. The leaves yield 0.6 per cent. of pilocarpine and 0.4 per cent. of jaborine, or a total of 1 per cent. of alkaloid. They also yield a very aromatic volatile oil, which is under investigation.—Pharm. Journ., Oct. 28, 1899, 397; from Rep. de Pharm. (3), *11*, 429.

Jaborandi—Commercial Inferiority as Evidenced in Galenical Preparations.—E. H. Farr and R. Wright have for several years experienced great difficulty in preparing standard preparations of jaborandi from commercial samples of the leaves. It occurred to them that an investigation into the strength of the tincture and liquid extract as found in pharmacy would serve to show whether such an experience was common to pharmacists, and also yield results of general interest. They have accordingly subjected twelve samples of each of the official preparations, obtained from various sources, to the process of assay recommended by them a number of years ago for the assay of the tincture of jaborandi (and other alkaloidal tinctures—see Proceedings, 1892, 507), with results which make it evident that the galenical preparations of jaborandi found in retail pharmacies at the present time are very deficient in strength, only containing about one-fifth the proportion of active constituents which, judging from the official doses, they are supposed to contain. The authors, however, do not think that pharmacists can be held altogether accountable for this. In looking for an explanation of this state of affairs, the most feasible one seems to be that for some reason or other the true jaborandi leaves—or at any rate, leaves of the best quality—are being withdrawn from the market, and so prevented from coming into the hands of pharmacists at all. It may be that the manufacturers of pilocarpine salts buy all samples of leaves rich in alkaloids.—Trans. Brit. Pharm. Conf., 1899, 381–384.

Jaborandi Leaves—Assay of Different Kinds.—For some years there have been several kinds of jaborandi leaves in the New York market. The variation in the price of these has led A. R. L. Dohme and H. Engelhardt to undertake an assay of three of these varieties, to determine whether their prices were justified by their relative contents of alkaloids. These three varieties are best differentiated by their sizes as they were vastly different in size, although also different in shape and texture. One was the typical large green leaf with slight lobe at the apex, smooth on the upper and rough on the lower surface, although not hairy; this we will call the large leaf. The second was a thicker and more leathery leaf curled under at the edges, more narrow than the larger leaf, and also smooth on the upper and rough on the lower side; this we will call the medium leaf. The third was a small broad leaf with the usual pilocarpus lobe at the apex and smooth on both sides. This the authors designate the small leaf. The methods of assay used were those of Keller and of Proehl, but they found that the latter is not as practical nor as exact as that of Keller, obtaining the most satisfactory results with the latter when using 15 grams of water under the provision of the following formula: Drug in No. 80 powder, 12 grams; ether, 90 grams; chloroform, 30 grams; ammonia water, 10 grams; water, 15 grams. Shake and let stand half an hour; then filter or decant off 100 grams or an aliquot portion of the liquid, preferably through a little absorbent cotton. Of the

liquid, 10 grams represent 1 gram of the drug. Extract the ethereal liquid with several portions of 5 per cent. sulphuric acid solution, and re-extract this with chloroform, after making alkaline with ammonia (the authors preferring chloroform alone instead of equal parts of chloroform and ether prescribed by Keller) and thereby avoiding emulsions. The results follow the figures representing percentages of alkaloids:

	Keller, Volumetrically.	Proehl, Gravimetrically.
Large leaf	0.201 (20 grams of water)	0.201
Large leaf	0.187 (10 grams of water)	
Large leaf	0.191 (15 grams of water)	
Medium leaf	0.129 (20 grams of water)	0.110
Medium leaf	0.144 (15 grams of water)	
Medium leaf	0.129 (10 grams of water)	
Small leaf	0.231 (20 grams of water)	0.269
Small leaf	0.239 (15 grams of water)	
Small leaf	0.230 (10 grams of water)	

These results show that none of the leaves examined were of standard strength, which should be 0.35 per cent. of total alkaloids.—Drugg. Circ., Feb., 1900, 28.

Buchu Leaves—South African Substitutes.—E. M. Holmes, after describing the different specimens of buchu leaves, *Barosma betulina*, Bart. Wendl., *B. crenulata*, Linn., and *B. serratifolia*, in the Materia Medica Museum of the Brit. Pharm. Society, their components and relative value, enumerates a number of species of the same and allied genera which are used in South Africa for the same purpose as buchu, some of which have at different times found their way into European markets as buchu substitutes. These are:

Adenandra fragrans, Roem and Schult., which occurred in the London market in 1882. The leaves are about the length of those of *B. crenulata*, but entire, oblong, obtuse, and more leathery in textures, and have a slight caraway odor.

Agathosma cerefolium, G. Don.

Agathosma microphylla, Mey., which has an anise odor.

Agathosma chortopila, Eckl. and Zeyh., which has a cummin odor.

Diosma ericoides, Linn., which has occurred several times in the drug market during the last twenty-five years, and is said to be preferred by the natives to the ordinary buchu. It has small heath-like leaves.

Diosma oppositifolia, Linn.

Diosma succulenta, Thunb,

Barosma Eckloniana, Barth., occurred in 1873 and again in 1898. The leaves are like those of *B. crenulata*, but rather broader and more distantly crenate-serrate.

Empleurum serrulatum, Sol., is the substitute which more frequently comes into the market and is designated as a "fine long buchu." It is distinguished by its acute apex, in which no oil gland is present, the apex of the leaves of the three species formerly official (B. P.) having a gland in the slightly obtuse apex. The fruits of *empleurum* are sometimes present with the leaves and are then easily distinguished by having only one follicle, while those of *barosma* have five. The leaves have the same odor as those of buchu, but yield only about 0.74 per cent. of essential oil. Finally,

Barosma venusta, Eckl. and Zeyh., was offered in 1884. It has small obovate or oblanceolate serrate leaves, from 2–4 lines long and about 2 lines broad.—Pharm. Journ., Jan. 27, 1900, 70.

Guaiac—Constituents of the Resin and Wood.—Investigations made by Prof. Schaer and E. Paetzold confirm the results obtained by Döbner concerning the constituents of natural guaiac resin, which are enumerated as follows: 1. Guaiacic acid. 2. Guaiaconic acid. 3. Guaiac-resinic acid. 4. Guaiac-yellow. 5. A substance probably identical with the guaiacic acid of Thierry. 6. Small quantities of vanillin. 7. Small quantities of volatile oil. The authors, furthermore, find that the wood contains the same constituents, and, in addition, a body resembling gutta percha and analogous to viscin, which they name guaia-guttin. The authors have also investigated the composition of

Palo-balsamo Wood (*Bulnesia Sarmienti*), and finds that this, besides large quantities of volatile oils, contains a resin mixture having essentially the composition of guaiac resin, and also some guaia-guttin. They likewise found

Guaiaconic acid, the mother-substance of "guaiac blue," in the wood of other plants belonging to the Zygophyllaceæ, viz., *Bulnesia Retams*, *Bulnesia arborea*, *Porlieria hygrometrica* and *Porlieria Lorenzii*, as also *Larrea divaricata*.—Apoth. Ztg., Sept. 27, 1899, 572; from Proc. Germ. Naturalists and Phys., Sept. 20, 1899.

Kosam Seeds—Constituents and Medicinal Properties.—Heckel and Schlagdenhauffen describe the seeds of *Brucea sumatrana*, known as "kosam seeds." The plant is found in the hot regions of China and in India. The seeds are contained in greyish egg-shaped drops, which have been found to contain fixed oil, gum, quassiin, saponin and sugar. Physalix and Bertrand have now isolated from the seeds a glucoside which they have named

"*Kosamin*." Moungal has given the seeds with success in cases of metrorrhagia, dysentery, and intractable diarrhœa. The decorticated crushed seeds are employed, the paste obtained being made into pills. Five seeds are given to children for the first day, six seeds for the three succeeding days. For adults the dose is ten seeds for the initial day, and

twelve for succeeding days. From their marked hæmostatic properties, it is possible that these seeds may prove useful in the treatment of catamenial disorders. — Pharm. Journ., May 5, 1900, 463; from Bull. Com., *28*, 131.

GERANIACEÆ.

Tropœolum Majus—Characters of Fixed Oil.—J. Gadamer isolated a fatty oil from *tropœolum majus* by extraction with ether. This oil solidifies on evaporation of the alcohol, but melts again with the warmth of the hand, the solidification being due to the presence of tri-erucin, which melts at 30.5° C. The erucin is converted into tri-brassidin (m. p. 44–55° C.). by treatment with potassium nitrite and nitric acid. On saponification of this body, erucic and brassidic acids are obtained, these being isomers. Although tri-erucin is contained in equally large quantities in the fixed oils of white or black mustard, or that of colza, it is noteworthy that it does not separate from these, whereas it readily crystallizes from the fixed oil of tropœolum.—Arch. d. Pharm., *237*, 471.

Flax Seed—Percentage of Oil in the Commercial Seed and Meal.—Charles H. LaWall and Robert C. Pursel report the results of the determination of fixed oil in commercial flax-seed and flax-seed meal. From three samples of the whole seed they obtained by extraction with carbon disulphide 35.28, 37.00 and 38.40 per cent. of oil. From nine samples they obtained an average of 25.96 per cent., and that these figures were nearly approached in most cases, there being only one sample that contained a low percentage (21.96 per cent.), whilst one sample contained a large excess of the pharmacopœial requirements, viz., 34.08 per cent. The U. S. P. requires not less than 25 per cent. of oil in the meal.—Amer. Jour. Pharm., Aug. 1899, 393. Proc. Pa. Phar. Assoc., 154.

Linseed Meal—Percentage of Ash and Oil in the Article Supplied in England.—Edwin Dowzard has ascertained the percentages of ash and oil in linseed meal supplied by different English firms, with the following results:

	Oil.	Ash.
	Per cent.	Per cent.
No. 1	39.9	3.4
No. 2	38.7	3.5
No. 3	35.7	3.3
No. 4	32.3	3.5
No. 5	32.0	3.4

Prof. Attfield, in his "Chemistry" (1898, 581), gives the percentage of oil commonly contained in linseed as 37 or 38 per cent., the ash as being

fairly constant and never rising above 5 per cent.—Chem. & Drugg., Sept. 23, 1899, 522.

Flaxseed—A New Sophistication of the Meal.—The U. S. P. requires flaxseed meal to contain 25 per cent. of fixed oil. E. H. Gane has examined a sample recently which contained the full amount of oil, but the oil was found to be unsaponifiable. Further examination showed that the natural oil of the seed had been expressed and its place supplied by a petroleum oil of about the same specific gravity. This is apparently a new sophistication.—Amer. Drugg., Jan. 10, 1900, 4.

MALVACEÆ.

Gossypium Herbaceum—Coloring Matter of the Flowers.—A. G. Perkin finds that the flowers of the cotton plant contain a peculiar coloring matter, which he has named

Gossypetin. It is a glucoside of the composition $C_{16}H_{12}O_8$, and is soluble in alkalies with an orange-red color, changing to green on oxidation. The hexacetyl compound of gossypetin, $C_{16}H_6O_8Ac_6$, forms colorless needles, melting at 212°–216° C. Gossypetin is probably a member of the flavone group of coloring matters, and is similar, but not identical with, thujetin, the coloring matter of *thuja occidentalis.*—Pharm. Journ., July 8, 1899, 25; from Proc. Chem. Soc., *15*, 161.

Cotton Seed—Industrial Products.—In an account of the origin, early history, botany, cultivation and uses of the cotton plant, F. H. Knowlton, of the U. S. National Museum, points out the industrial importance that the seed has assumed in recent years. It is only a few years ago, comparatively, that the fibre was almost the only part utilized, the seed, stems, etc., being practically worthless, and although it had been known for a long time that the seeds contained an abundance of oil, it was not until the fifties that satisfactory processes were invented for extracting it. In 1860, the total valuation of these products was only $741,000; in 1894, it had increased to $30,000,000, and it is believed that the census of 1900 will show a valuation of approximately $50,000,000. A ton of 2000 lbs. of the seed will yield meals amounting to 1,089 lbs, of which 800 lbs. is cake, while the hulls separated as bran for cattle food, etc., amount to 891 lbs. Three hundred pounds of crude oil is yielded, which under various processes of purification yields summer yellow, summer white, winter yellow, and salad oil, cotton-seed stearin, cottolene, soap stock, etc. Indeed, under recent improvements the amount of oil obtainable from the seeds has been increased to from 40 to 45 gallons per ton, the hulls and meal being proportionately reduced. The seed, in place of being a source of expense and worry to the grower, as was formerly the case, has thus become extremely valuable.—Merck's Rep., Sept., 1899, 392.

Crude Cotton Seed Oil—Presence of a New Crystalline Body.—L.

Marchleuski has separated from the soda liquors obtained in the purification of cotton seed oil, a new body, by extraction with ether, which he has named

Gossypol, and to which he provisionally assigns the formula $C_{13}H_{14}O_4$. Gossypol is a finely crystalline yellow substance, insoluble in water, but readily soluble in alcohol, ether, benzene, and in alkalies. It gives with concentrated sulphuric acid a cherry-red color, whence the author concludes that the red color produced when crude cotton seed oil is treated with sulphuric acid is due to gossypol. — Pharm. Journ., Sept. 9, 1899, 235; from. Journ. f. prakt. Chem. *60*, 84.

STERCULIACEÆ.

Kola Nuts—Economic Uses.—In continuation of his researches upon kola nuts and the preparations made from them (see Proceedings, 1899), L. Bernegau has contributed a paper at the recent meeting of German Naturalists and Physicians (Sept. 18, 1899), in which he calls attention to the various economic uses of kola nuts, and particularly as a beverage to replace coffee, tea, cocoa, maté, &c. He has already previously called attention to a palatable and refreshing beverage.

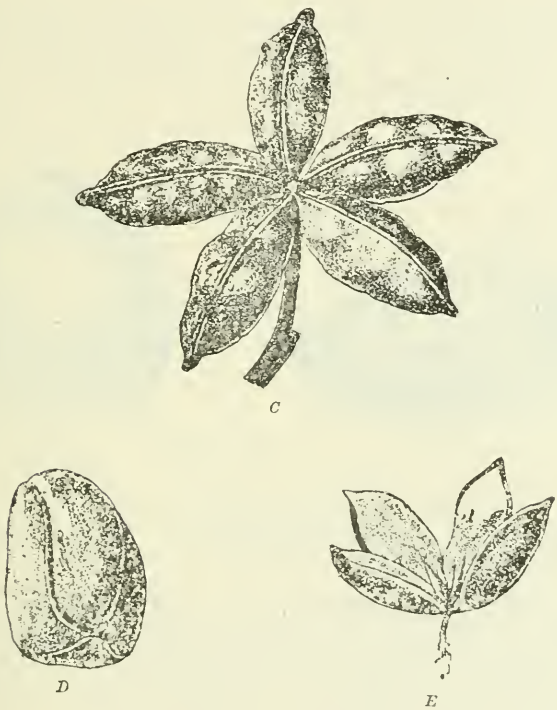
Kola-Milk, which is obtainable by extracting fresh kola nuts with weak alkaline water, and adding the extract to skimmed milk in certain proportions. A bitterless kola-nut meal is now supplied in the German market, and from this the kola-milk may be prepared as follows: One pound of the meal is stirred with 5 liters of cold water, allowed to stand over night, then boiled for a quarter of an hour, and expressed. The expressed liquor is then filtered, sterilized, and mixed with enough sterilized skimmilk (about 97.5 liters) to make 100 liters. Economically an extract might be prepared from the fresh nuts in Africa, and this exported in large containers to one of the European ports, where, under similar supervision and care, as in the case of extract of meat (from Argentinia, Rep.) it might be transferred to suitably small containers. The bitterless kola-meal, before referred to, has been examined by the methods of C. C. Keller and of K. Dieterich, and found to contain on an average 2.09 total alkaloid. The meal is also supplied, having a coffee or a cacao aroma.—Apoth. Ztg., Sept. 23, 1899, 563–565.

Kola Nuts—Determination of Botanical Source.—Dr. E. M. Holmes observes that the kola nuts in commerce have for some time puzzled botanists and pharmacognosists on account of their variation in color and form. Evidence has not hitherto been forthcoming to show whether these seeds are the product of different species, or of varieties of one species. Light has been thrown on this subject in a "Monograph on the Genus Cola," recently written by Dr. K. Schumann, who has divided that genus, which now comprises thirty species, into sub-genera. He includes the kola nut in the sub-genus *Autacola*, which is characterized by the stamens,

or rather sessile half-anthers, being arranged in two rows, one above the other, and not in a single row as in the majority of species. Dr. Schumann describes the fruit of

Cola acuminata (shown by Fig. 64, *C*) as having a fleshy yellow peri-

FIG. 64.



C

D

E

carp, with an odor resembling that of a Maréchal Niel rose, and containing four or five large seeds (Fig. 64, *D*). The seeds have a white testa, which becomes brown when the fruit dehisces, and they become exposed to the light. The embryo consists of four cotyledons, of a "carmine" red color, which, when expanded, present a triangular or externally convex form. These remarks apply to the kola nut brought to Germany from the Cameroons.

Examination of the specimens of the kola plants in the Herbarium of the Botanical Museum at Berlin showed that one plant from Ashanti, collected by Cummins, and another from Sierra Leone, collected by Afzelius, differed from the true *Cola acuminata* in having the stigma broad, obtuse, and closely pressed to the ovary. Specimens of the kola nut of commerce, having two cotyledons, obtained direct from Togoland, and of the tree yielding it, proved to Dr. Schumann that the kola nut of commerce having

two cotyledons is the product of the tree having obtuse appressed stigmas, and not of *C. acuminata*, which has pointed, free, curved stigmas. This new species he has named.

Cola vera. It has also seeds of a carmine color when fresh. But the two seeds germinate in a totally different manner. In the case of *C. acuminata*, the four colytedons spread open and the plumule grows up in the centre (Fig. 64 *E*) ; in the other, *C. vera*, the two colytedons remain closed, and the plumule arises outside them, as shown by Fig. 65 *C*, a single colytedon being shown by Fig. 65, *D*. There are other edible kola

FIG. 65.

seeds, such as the seeds of *C. lepidota*, Schm., and probably also of *C. cordifolia* ; but the seeds of *Cola vera* are the most highly prized.—Pharm. Journ., June 23, 1900, 665–666.

Sterculia—A Quillaya Substitute.—C. Hartwich describes a wood imported from Venezuela, which possesses properties analogous to quillaya. It is undoubtedly derived from a plant belonging to the sterculiaceæ, probably from a species of sterculia. The wood, which is fibrous, yellow and covered by a fibrous bark, is composed mainly of a parenchyme which contains starch, and is characterized by the occurrence of single vesicles, or such united into small groups. The wood is traversed here and there by broad tangential bands of strongly thickened fibres. The parenchyma cells bordering these bands now and then contain single crystals of calcium oxalate. The medullary rays are up to six cells in width, the cells strongly extended radially, and when cut tangentially are shown to be uncommonly high. The bark exhibits a sclerotic ring beneath the cork, and the intermediate bark isolated groups of stone cells. In the bast-rays of the bast groups of strongly thickened fibres with crystal cells on the margin may be recognized, the latter being covered by distinct layers. In the soft bast situated between these groups, bundles of sieve tubes are revealed. The chemical examination proved the presence of a body which in aqueous solution produces strong frothing. The taste of the drug also reminds of that characteristic of drugs containing

saponin, such as senega, quillaya, etc. The aqueous extract of the wood amounts to 15.5 per cent., of the bark 21.9 per cent. These extracts, when dissolved in alcohol, gave a brown-red color with sulphuric acid, while the portion insoluble in alcohol produced a red color with ferric chloride, and a red-violet with bromine.—Schweiz. Woch. f. Chem. u. Ph., 1899, 522.

Cacao—Wild Growing Plants the Source of the Pará and Amazonas Product.—According to a recent Br. Consular Report the cacao plant is not cultivated in the states of Pará and Amazonas, but grows wild and in great profusion. When the fruit is mature it is picked and the seeds are sun-dried and sold to exporters. That is practically the only time when the plant receives attention. The Pará quality is said to be one of the best in the world, in that it readily assimilates the delicate perfumes given to it in the manufacture of chocolate.—Pharm. Jour., April 28, 1900, 456.

Theobroma Kalagua—A Substitute for Kola.—Hendrickx and Coremams, from experiments made with *kalagua* leaves on various herbivorous domestic animals, regard it as a stimulant on the digestive system which is likely to prove useful as a substitute for kola and cacao. It has a distinct diuretic action, but is without influence either on the heart, the respiratory organs, or the temperature, nor does it possess any antiseptic properties.—Schweiz. Wochenschr. f. Pharm., 1899, 526.

TERNSTROMIACEÆ.

Tea Leaves—Varieties and Substitutes in the Museum of the British Pharmaceutical Society.—E. M. Holmes describes specimens of tea (*Camellia Thea*, Link.) in the collection of the Materia Medica Museum of the British Pharmaceutical Society, viz.: 1. The leaves of the plant dried; 2. Black tea of commerce; 3. Green tea of commerce; 4. "Flower" of tea; 5. Chinese "old man's eyebrow" tea: 6. Brick tea used by the Tartars. None of these, except perhaps the "flower" of tea, represents the form of tea used for the extraction of caffeine, for which purpose much cheaper grades, damaged tea, and "tea dust" are used. Other so-called teas in the museum collection are the following:

Abyssinian or Arabian Tea (*Catha edulis*, Forsk., Celastraceæ), described in Pharm. Journ. [1], *12*, p. 269, and its active constituents in (3), *18*, p. 1009.

Batoum Tea (*Vaccinium arctostaphylos*, Linn., Ericaceæ), an account of which is given in Pharm. Journ. (3), *15*, pp. 573–771.

Bourbon or Faham Tea (*Angræcum fragrans*, Thon., Orchidaceæ), "Gard. Chron.," 1850, p. 599; "Kew Bull." 1868, p. 181; Bouton, "Flore Méd. de Maurice," p. 129.

Brazilian Tea (*Stachytarpheta jamaicensis*, Vahl., Verbenaceæ), Lunan, "Hort. Journ.," *2*, pp. 257, 258; "Treas. Bot.," *2*, p. 1090.

Cape or Bush Tea (*Cyclopia genistoides*, Vent., Leguminosæ), Pharm. Journ., (3), *11*, p. 549; Pappe, "Fl. Med. Cap.," p. 9.

Labrador Tea (*Ledum latifolium*, Jacq., Ericaceæ), "Amer. Disp." 1895, p. 478.

Mountain Tea (*Gaultheria procumbens*, Linn., Ericaceæ), "Nat. Disp." 1886, p. 724.

New Jersey Tea (*Ceanothus Americanus*, Linn., Celastraceæ), "Nat. Disp.," 1886, p. 407.

Oswego Tea (*Monarda didyma*, Linn., Labiatæ), "Nat. Disp.," 1886, p. 987.

Paraguay Tea (*Ilex paraguensis*, A. St. Hil., Aquifoliaceæ), "Nat. Disp.," 1886, p. 810. This tea is employed in two different forms, (1) Broken leaves, (2) powdered leaves and stalks. The first is employed in Brazil, the second in the Argentine Republic. Specimens of the gourd and the pipe-like strainer or "Bombilla" used in the making and drinking the tea are also shown in the Museum.

West India Tea (*Capraria biflora*, Linn., Scrophulariaceæ).

None of these except *Ilix paraguensis* contain caffeine, which, however, is found in cola (*Cola acuminata*, Schott and Endl., Sterculiaceæ), and Guarana *Paullinia cupana*, H. B. and K., Sapindaceæ).—Pharm. Journ., Nov. 25, 1899, 495–496.

Tea—Substitutes.—The "Ztschr. f. angew. Mikroskopie" calls attention to a number of tea substitutes. The so-called "Böhmischer-Thee" is composed of the leaves of *Lithospermum officinale;* "Labrador-Tea" is derived from *Ledum palustre;* "Abyssinian Tea" is produced in Germany from the leaves of *Epilobium angustifolium*. Of tea-powders, the so-called "gun powder" alone is genuine, while the following are compounded substitutes: "La Veno Beno" is composed of sumach and catechu; "Chinese Economist" is prepared from flour and catechu; "Caper-tea" from tea-dust, flour and coloring matters; "Lie-tea," from various leaves.

The genuine tea-leaf is recognized by boiling it for 5 minutes in solution of chloral hydrate, 1 : 2, spreading on the slide and examining it under the microscope. It is distinguished from other leaves by its shape, together with the tooth-glands, the crystal-cells, and particularly the sclereids—the latter being so characteristic of tea-leaves that confusion with substitutes becomes impossible.—Pharm. Centralh., Oct. 5, 1899, 620.

Tea—Russian Substitutes.—E. Collin calls attention to several substitutes for tea largely used in Russia, and gives an exhaustive histological description of these fictitious teas and the genuine article in "Jour de Pharm." (6) *11*, 15–52. These substitutes comprise the leaves of two species of *Epilobium*, viz., *E. angustifolium* and *E. hirsutum*, which produce the so-called "Kaporie tea," and the leaves of *Vaccinium arctostaphylos*, and sometimes of *V. myrtillus*, which produce the so-called "Caucasus tea."—Pharm. Journ., Feb. 5, 1900, 91.

AURANTIACEÆ.

Murcia Lemons—Superiority over the Messina and Palermo Fruits.—Flora D. Madgshon calls attention to lemons imported into Edinburgh from the province of Murcia, known as the African district on account of its tropical climate. They bring a little higher price than the Messina or Palermo lemons, owing to fine smooth skin and clean appearance, but appear to possess other qualities which make them superior to either of the other fruits mentioned. Though the author was led to undertake their examination and comparison by reason of their fine appearance and large size, three of them were examined weighing respectively 19½, 13½ and 12 ozs. The fruit as ordinarily received is about the same size as Messina lemons. But it is in the aroma that the Murcia lemon excels. In addition to the flavor which we are accustomed to call "lemon," they are associated with what may be called a "bouquet." Palermo lemons afford an aroma and flavor suggestive in a faint way of musk and verbena. Messina lemons yield a purely lemon flavor and aroma. The Murcia lemons embody the lemon flavor of the Messinas with the scented flavor of the Palermos in a mellower form. The Pharmacopœial tincture (B. P.) made from Murcia lemons is distinctly superior in point of flavor to any the author made from other kinds of lemons, and the same can be said of the syrup. The juice of the Murcia lemons is slightly sweeter and contains about 4 grains less acid per ounce than that of Messina lemons. They reach the English markets in November, and the supply is continuous until April, being most abundant in December and January.—Pharm. Journ., Feb. 17, 1900, 148.

VITACEÆ.

Wine—Removal of Mouldy Taste and Odor.—Kulish proposes for the restoration of wine which has acquired a mouldy taste and odor to add to 100 liters of the wine from 500 to 1,000 Gm. of charcoal in pieces of about the size of a filbert, and to allow this to remain in contact, stirring once weekly, for 6 to 8 weeks, then to draw off the wine. A red wine which had become very mouldy was thus restored without material diminution of color. Persistently turbid wines may also be clarified by this method.—Pharm. Centralh., Sept. 20, 1899, 584.

Alcohol-Free Grape Wines—Examination.—P. Süss has examined two representative samples of so-called alcohol-free grape wines, one white, the other red. They both contained mere traces of alcohol, and contained no preservative agents—sulphurous, salicylic or carbonic acid—nor saccharin. The designation of wine is therefore a misnomer, since they are simply pasteurized grape juices, which may keep unchanged for several days after opening the bottles. Their acid content was somewhat high, their sugar content comparatively low. While the sp. gr. of these two wines was 1.0588 and 1.0525, that determined in two other samples of

white and red wine was respectively 1.039 and 1.0520. The extract content also varied considerably; but, as may obviously be expected, uniformity of composition cannot be looked for in these products.—Pharm Centralh., Aug. 31, 1899, 529.

ERYTHROXYLACEÆ.

Coca Leaves—Description of Specimens in the Museum of the Britsh Pharmaceutical Society.—Dr. E. M. Holmes describes the specimens of coca leaves in the collection of the Materia Medica Museum of the British Pharmaceutical Society. They include: (1) Peruvian or Truxillo coca, derived from *Erythroxylon coca*, var. *novo-granatense*, Morris, and an original package of leaves; (2) Bolivian or Huanuco coca, obtained from *E. bolivianum;* (3) coca leaves from a plant cultivated in Java under the name of *E. coca*, var. *Spruceanum*, Burck.; (4) specimens of Bolivian coca cultivated in Ceylon. Botanists are not agreed as to the specific rank of the three plants, some considering them as varieties of one species. The leaves are, however, distinctly different in appearance, those of the Bolivian plant having a brownish-green tint, a thicker texture, a reddish midrib, and a slender ridge in the centre of the upper surface of the midrib, and are about twice as long as broad. The Peruvian leaves are of a pale green color and thin texture, are very brittle, the midrib is greenish and has no ridge on its upper surface, and the two lateral lines marking where the leaf is folded in vernation are less marked; they taper considerably to the base and are about three and a half times as long as broad. The Java leaves are about two and a half times as long as broad, but otherwise resemble the Peruvian leaves, except that the apex is not rounded but acute. It, however, differs in habit of growth and in the proportion of its alkaloidal constituents, containing more cinnamyl-cocaine and truxilline (or isatropyl-cocaine or cocamine) than the other varieties. It also yields benzoyl pseudotropeine. Truxilline is the alkaloid to which the occasional poisonous effects of cocaine have been attributed, and is also found in Peruvian coca. Benzoyl pseudotropeine is less toxic than cocaine, and is better adapted for use in operations on the eye. Coca leaves rapidly lose in cocaine percentage if exposed to damp air. Hence crude cocaine is now largely imported from Peru and purified in England.—Pharm. Journ., Nov. 25, 1899, 496.

Coca Leaves—Adulteration with Small Jaborandi Leaves. — John Barclay found a sample parcel of coca leaves obtained from a London broker to consist of from 40 to 50 per cent. of small jaborandi leaves mixed with Bolivian coca. The bulk of the adulterant leaves had the following characters: From ⅝ inch to 1½ inch in length, from ⅜ inch to 1 inch broad, margin entire, revolute, unequal at the base, without petiole, oval-oblong in shape. A smaller proportion of lanceolate leaves with short petioles, but in other respects similar, was also present, but the characters

of the two varieties correspond generally with those described by Holmes as belonging to *Pilocarpus microphyllus* and *P. spicatus* respectively. Both varieties may readily be distinguished from coca-leaves, the apex of which is quite different, and which possess the well-known curved line from base to apex at each side of the midrib. The leaves were extracted and pilocarpine obtained from them.—Chem. and Drugg., Dec. 23, 1899, 1030.

PAPAVERACEÆ.

Opium—Cultivation and Collection.—E. T. Bowers contributed an interesting paper at the meeting of the Maine Pharmaceutical Association in 1899, in which he gives a concise review of the cultivation and collection of opium as practised in different countries. While opium of good quality has and can be cultivated in this country, as in Europe, the expense incurred exceeds the market value of the product, experiments having been tried in Virginia, Tennessee and California.—Proc. Maine Pharm. Assoc., 1899, 58–63.

Persian Opium—Adulteration for the Chinese Market.—According to a recent consular report, the ruling price for Persian opium in some of the Persian markets is frequently higher than the price quoted for Persian opium at Hong Kong. This is accounted for by the fact that at Yezd, which takes most of the drug in its unprepared state, it is adulterated with Sarcocolla gum or resin (*Penæa mucronata*) and other ingredients, the proportion being ten of opium to six of the adulterant. Made up in this way, it finds ready sale in China, for the Chinese authorities do not analyze the opium for the morphine contained in it. As long as it complies with certain conditions they are content, and this adulterated opium appears to fulfill the conditions. The competitors of the Yezd manipulation at Ispahan have now found out the secret of this adulteration, and are said to be now hard at work in the same line.—Pharm. Journ., Aug. 5, 1899, 157.

Opium — Modification of the U. S. P. Process of Assay. — William R. Lamar, who engaged in assaying a sample of powdered opium according to the U. S. P. method, noticed, after having concentrated the aqueous liquid and brought it to the weight of 20 Gm., as officially directed, that the addition of the required 10 Gm. of alcohol caused a pronounced flocculent precipitate. This precipitate, after the addition of 25 Cc. of ether, shaking, etc., did not diminish, and, as suspected, was by experiment determined to contaminate the final precipitate of morphine, and to that extent vitiate the results of the assay. In searching for a method whereby this could be prevented, he found this in the use of an increased amount of alcohol as a preliminary addition to the 20 Gm. of aqueous extract. He adds 60 Gm. of alcohol instead of 10 Gm., under specific directions, filters off the precipitate produced, washes the filter with a mixture of alcohol and water in the same proportions till the washings pass bitterless, and,

having added 35 Cc. of water, evaporates off the alcohol and concentrates to 14 Gm., as officially directed, for the original aqueous opium solution. This is transferred to an Erlenmeyer flask, brought with the washings to 20 Gm., 10 Gm: of alcohol are added, and the process continued to completion according to the precise directions of the U. S. P., and as though this intermediate precipitation by alcohol had not been effected. This additional step is easily executed in an hour's time, and insures the purity of the morphine finally obtained. For the details of the modified method, see Amer. Journ. Pharm., Jan., 1900, 36–39.

CRUCIFERÆ.

Cheiranthus Cheiri, L.—*Active Constituents of the Seeds.*—In a former paper, Moritz Reeb has reported on the existence of a glucoside, cheiranthin, belonging to the pharmacological group of digitalin, in the seeds of *Cheiranthus Cheiri* L. He finds now that these seeds contain a second active constituent, which is an alkaloid, but not a cardiac poison. He has given to this the name

Cheirinine, and prepares it as follows: The finely powdered seeds, after treatment with petroleum ether, are extracted with alcohol of 60–65 per cent., the alcohol is distilled off, the residual aqueous liquid filtered, and the clear filtrate precipitated with neutral lead acetate. The excess of lead is removed by sulphuric acid, the liquid again filtered, carefully neutralized with ammonia, concentrated on the water bath, and the neutral liquid shaken out with ether. The ether-solution, after washing with a little water, is evaporated, the residue of evaporation is dissolved by the aid of the water-bath in water, and filtered through charcoal. The filtrate is now treated with lead subacetate and ammonia, the precipitation removed by filtration, the lead removed from the filtrate by sulphuric acid, again filtered, and the filtrate, after neutralization with ammonia, evaporated on a water bath to a small volume. It is now rendered faintly alkaline with ammonia, shaken out with ether, and the ether-solution, after washing with a little water, slowly evaporated. White crystals of cheirinine are thus obtained, which, after washing with petroleu methether, solution in acetic ether, fractional precipitation with petroleum ether, and final recrystallization from water, are obtained perfectly pure. Cheirinine so obtained forms small, perfectly colorless, crystalline needles, which are insoluble in cold water and petroleum ether, but soluble in warm water, alcohol, ether, chloroform, and acetic ether. They melt at 73°–74° C., are neutral in reaction, are precipitated by the usual alkaloidal precipitants, and have an elementary composition corresponding to the formula $C_{18}H_{33}N_3O_{17}$. It possesses hypnotic and antipyretic properties, and may therefore possibly find practical application in medicine.—Apoth. Ztg., Sept. 23, 1899, 567; from Arch. f. Exp. Path. u. Pharmcogn., xliii, 130.

Diplotaxis Tenuifolia, *D. C.—Presence of a Poisonous Alkaloid.*—The

observation of Planchon (1898) that sheep feeding on *Diplotaxis tenuifolia*, D. C., a plant widely distributed in Southern France, have been poisoned by it, and a recent case of poisoning of a child in Germany, has induced Dr. George Heyl to undertake a chemical examination of this plant, which in recent years has become more widely distributed in Germany. By a method given, the author has succeeded in isolating an alkaloid possessing pronouncedly all the characters usual to organic bases, but apparently uncrystallizable, and having an odor resembling nicotine. The toxity of this base has been determined by Prof. Schenck, of Würzburg.—Apoth. Ztg., May 30, 1900, 361; from Südd. Apoth. Ztg.

FLACOURTIANEÆ.

Chaulmoogra Seeds—Question of Botanical Source.—The seeds of chaulmoogra met with in commerce are generally considered to be the product of *chaulmoogra odorata*, notwithstanding that the late Daniel Hanbury had already pointed out that they differ considerably from the seeds of that species. He had described and figured Chinese chaulmoogra seeds in "Science Papers" as imported from Siam into China, as having foliaceous, lanceolate cotyledons, which he recognizes as not being identical with *chaulmoogra odorata* of Roxburgh, that authority describing the cotyledons of *C. odorata* as being subreniform, with the radicle variable. Notwithstanding this, in works on materia medica and in museums, the chaulmoogra seeds of Hanbury are attributed to *C. odorata*. G. Desprez has recently received from Calcutta specimens of both seeds. He describes the

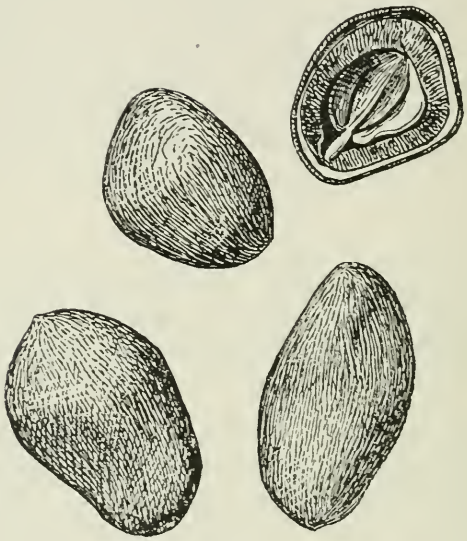
True Chaulmoogra Odorata Seeds as being larger, less uniformly gray, the testa being marked with dark patches. The integuments are not so brittle as in the ordinary kind, the kernel is reddish and marked with white. The cotyledons are thick, subreniform, the radicle placed at the side. These seeds contain a large amount of hydrocyanic acid. The seeds generally met with in commerce are uniformly gray in color, the integuments are brittle, the kernel is dark in color with rough surface, the cotyledons are foliaceous-lanceolate, and the radicle direct, as described by Hanbury. These seeds contain no prussic acid.—Pharm. Journ., May 12, 1900, 495; from Journ. de Pharm., [6], 11, 315.

Referring to the paper of Mr. Desprez, Dr. E. M. Holmes gives the following description of the seeds that are sold as chaulmoogra, taken from a "Report on the Oil Seeds and Oils in the Indian Museum," by M. C. Cooke (1876), a work which is rather scarce and generally inaccessible, in the hope that he may throw some possible light on the subject. The first of these is the seed of

Gynocardia odorata R. Br., which must be regarded as the genuine chaulmoogra seed (see Fig. 66). These are irregular in size and shape,

quite smooth externally, of a grayish color, or with a pale brownish tinge, 1 to 1¼ inch long and ⅜ to ¾ inch broad in the widest diameter. The

FIG. 66.



kernel shows two flat cordate ovate cotyledons and a straight radicle, immersed in oily albumen. The second kind are the seeds of

FIG. 67.

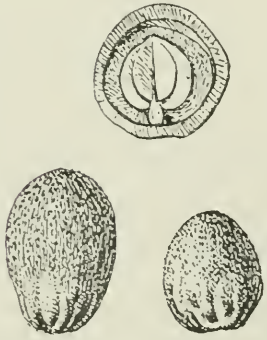
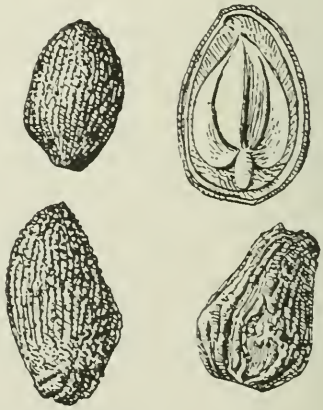


FIG. 68.



Hydnocarpus anthelmintica Pierre, the seeds figured and described by Daniel Hanbury in "Science Papers," but the illustration there given does not accurately represent the markings on the seed coat. These seeds, shown by Fig. 67, when freed from adherent dried pulp with which many

of them are coated, are about ½ to ¾ inch long and ⅜ to ½ inch in the widest diameter, *marked at one end with short radiating interrupted ridges*, occupying about one-third the length of the seed. The rest of the surface is slightly rough to the touch, with very faint raised points and lines running in a longitudinal direction. The embryo resembles in character that of *Gynocardia odorata*, but the radicle sometimes faces the side of the seed and sometimes the base. A dark stain-like chalaza is visible on the outer surface at the end of the seed opposite the radicle. The ridges on the testa are at the chalazal end. The third kind is

Hydnocarpus Wightiana, Blume. The seeds (Fig. 68) are rather more uniformly obvoate, and *taper more to one end* than the previous two, and *are strongly marked with irregular raised rough and minutely warty* lines. The rough surface readily distinguishes them at sight, aad the color is more of an ashen than a brownish gray. The embryo also shows three distinct veins on each cotyledon as in the other species. The testa is thin and more easily crushed than the other two species. The author considers it possible that it is this seed that constitutes the false chaulmoogra referred to by Desprez. The oil of both the last two seeds has been used as a substitute for chaulmoogra oil, the seeds themselves bringing only half the price of the genuine seeds of *Gynocardia odorata*.—Pharm. Journ., May 19, 1900, 522.

DROSERACEÆ.

Parnassia palustris—A Remedy in Epilepsy. — Dr. Peters recommends the herb of *Parnassia palustris* as an efficient and at the same time, innocent remedy in cases of epileptic spasms. The entire plant, including the root, is used in the form of a tincture made in the proportion of 1 : 5, a half teaspoonful being given to adults thrice daily after meals. In the event that the tincture should produce congestions of the head, an infusion is prepared by infusing two teaspoonfuls of the finely-cut drug in ½ liter of boiling water for fifteen minutes, and given as tea in two portions night and morning. — Pharm. Centralh., Oct. 5, 1899, 611 ; from Rep. of Cæsar and Loretz, Sept., 1899.

VIOLACEÆ.

Viola Tricolor—Methyl Salicylate a Constituent.—In 1897 H. Kraemer (Inaug.-Diss., Marburg), called attention to the fact that when the fresh new sprouts of *Viola tricolor* are rubbed between the fingers the odor of oil of wintergreen is developed. Referring to this statement, Schimmel & Co. now announce that they have recently also succeeded in proving the presence of methyl salicylate in this plant. The green, flowering plant, with the root, yielded on distillation only 0.00859 per cent. of oil, which, though small in quantity, was determined to be almost entirely methyl salicylate.—Schimmel Rep., Oct., 1899, 56.

CACTACEÆ.

Anhalonium Lewinii—Yield, Character of Alkaloids, and Physiological Action.—Dr. W. E. Dixon finds that "mescal" (*Anhalonium lewinii*) acts differently from any other known substance, although in isolated properties it resembles many. While it was at first considered to resemble *Cannabis indica* most closely in its effects, it differs from the latter in never giving rise to merriment, but rather to a condition of ideal content, and that it produces wakefulness. In its marked effect on the brain and cord, it is closely related to strychnine, but whereas strychnine acts mainly on the cord, the effect of "mescal" is mainly cerebral, and opisthotonos never occurs. It resembles nicotine in its effects on nerve, first paralyzing nerve cells and thin fibres, and in other properties it may be compared to digitalis and to cocaine: while in its peculiar stimulation of the occipital cerebrum "mescal" appears to stand alone. Its properties lead the author to hope "mescal" may be of use in therapeutics.

Dr. White has also prepared and investigated the four alkaloids of "mescal" described by Heffter (see Proceedings, 1899, 743–744), following and amplifying the method employed by the latter. *Mescaline* and *anhalonidine* were obtained (about equal amounts of each) to the amount of 1.16 per cent. of the crude "buttons;" *anhalonine*, 0.46 per cent., and *lophophorine*, 0.14 per cent., all in a beautifully crystalline condition with the exception of the last named, which appears to be crystalline only in the form of a salt. All are freely soluble in distilled water, alcohol or normal saline solution, and possess remarkable similarity in their physiological actions, *lophophorine*, however, possessing the greater toxicity.—Pharm. Journ., Oct. 14, 1899, 357; from Journ. Physiol., Sept. 1899, 69 and 71.

CUCURBITACEÆ.

Melon Root—Emetic Properties.—Heberger has extracted from melon root and the root of other cucurbitaceæ, a bitter extractive which possesses both purgative and emetic properties, and which he has named

Melon Emetine.—Langeweiz has found this substance to produce emesis in doses of 50 to 70 centigrammes, and that the powdered root of the *wild* plant is emetic in the same doses. The cultivated root, also, cannot be taken in large doses without danger.—Pharm. Journ., Sept. 9, 1899, 251; from L'Union Pharm., 40, 304.

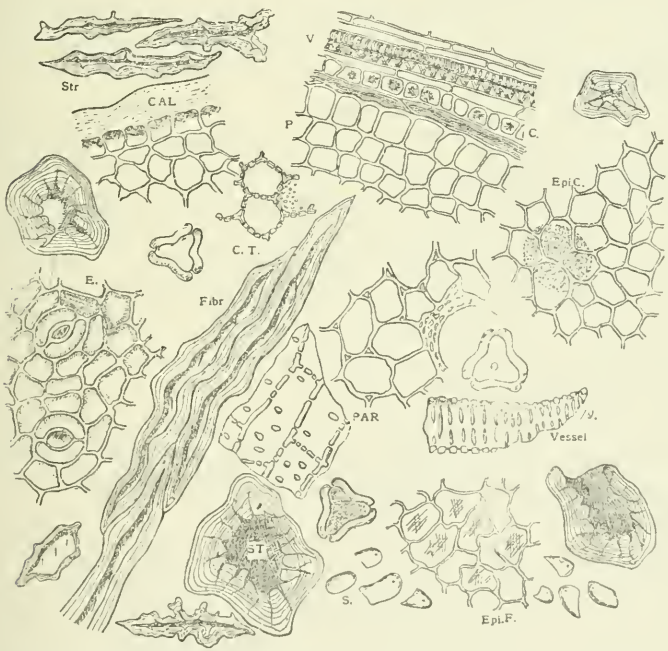
Colocynth—Cultivation in Cyprus.—According to a recent consular report, the cultivation of colocynth (*Citrullus colocynthis*) is likely to become an important industry in some parts of Cyprus. The fruit is collected from June to August, is spread in the sun, being stirred two or three times a day that it may dry uniformly and quickly, after which it is peeled by the women of the village, who are trained to the work. This is delicate work, and requires care in order that the naturally friable fruit

may not be broken and rubbed. For this purpose the dried fruit is sprayed the day previous with a little water, about 500 fruits constituting a day's work for one woman. The dried, peeled and sound fruits form the first quality and are called "apples." The badly peeled and broken fruits are called "psicha." The colocynth of Morphon and Papho is considered to be of a higher quality than from some other parts of the island.—Pharm. Journ., July 1, 1899, 9.

MYRTACEÆ.

Cloves—Histological Elements of the Powder.—Prof. Smith Ely Jelliffe describes the anatomical structure of cloves, and points out the histological elements of the powder, which are shown in the accompanying cut (Fig. 69), as follows: The powder of cloves is composed of a great many diverse elements, and its complete study is attended with much patient effort. The powder is dark-brown. It contains parenchymatic tissues,

FIG. 69.



Cloves in Powder.—*Epi C*, epidermis of calyx, showing oil glands beneath; *Epi F*, epidermis of corolla; *E*, epidermis of outer side of calyx teeth, with stomata; *Cal*, cross section of calyx (*Epi C*), outer cuticularized wall and collenchymatic tissues; *P*, parenchyma of body of cloves with fibres, *V*, vessels, and *C*, crystals; *Par*, parenchyma of fruit body in cross section to right, and longitudinal section to left, the latter showing pitted parenchyma; *St*, stone cells from the stem of the cloves; *Str*, sclereids from the wall of the fruit; *O*, pollen grains; *Fibr*, fibers from the clove stem; *CF*, pitted parenchyma from cotyledons; *S*, starch grains from seed.

collenchyma, bast fibers, wood fibers, spiral and annular ducts, tracheids, crystals, epidermis of calyx lobes with stomata tissue from corolla, pollen grains, tissues of the seed, and if much stem has been included, the char-

acteristic sclereids and bast fibers of this part of the fruit are in evidence. Bast fibers are conspicuous features in the powder; when unbroken, they measure from 300 to 400 mikra long and from 40 to 50 mikra in diameeter. The degree of lignification varies widely. The pollen grains are characteristic. They are tetrahedronal, and may be empty or may contain brownish, oil-stained protoplasmic contents. They measure about 15 mikra to a side. The vessels are very delicate, and rarely measure more than 4 to 10 or 15 mikra in diameter. They have spiral or annular markings, and may be accompanied by delicate tracheids, measuring about the same in diameter. Epidermis cells with stomata do not call for special mention, as these latter are not of any diagnostic significance. The crystals are small and may readily be overlooked. They measure from 8 to 16 mikra. Tissues derived from the petals may be readily recognized by the regular irregularity so characteristic of this type of tissue. In the seed, pitted parenchymatic cells, measuring 50 to 70 mikra, are found. These contain irregular shaped starch grains, but are often much compressed and elongated. Some of the larger grains measure from 30 to 35 mikra, while the smaller ones average 5 to 7 mikra. If the powder contains much tissue from the stem, the numerous isodiametric sclereids (100 to 130 mikra) are found, though similar sclereids are also present to some extent in the walls of the fruit. Larger pitted vessels also are indicative of admixture with stem, and the irregular bast fibers are characteristic. Many of these have knob-like ends, and frequently average, according to the measurement of Tschirch and Oesterle, 8 to 26 mikra in diameter. In addition to the rosette crystals, cubical crystals (7 x 7 mikra) may be found. A further chemical reaction is noteworthy in addition to those all ready described. Solutions of chloride of iron stain most of the tissues dark-blue to black, due, it is said, to the saturation of such tissues with eugenol.—Drugg. Circ., Jan., 1900, 4.

Jambul Seeds—Probable Effect in Diabetes Mellitus.—Referring to the reputation which jambul seeds have gained for the treatment of diabetes mellitus, in the form of the preparation introduced by Boersch under the names of

Antimellin or Djoïatin, Dr. Lenné observes that, although these seeds in the fresh state have been used with benefit in such cases by the natives of Java, they have no effect whatever in reducing the quantity of sugar; they simply appear to act as a palliative, enabling the patient to bear the burden of his illness with more comfort.—Pharm. Centralh., Oct. 26, 1899, 657.

"Stringy-Bark" Eucalypti—Percentage and Composition of Volatile Oils in Different Species.—In continuation of their researches on the volatile oils of the "stringy-bark" eucalypti (see Proceedings, 1899, 562), R. T. Baker and H. G. Smith report on the percentages of volatile oils obtained from different species of *Eucalyptus* and the composition and characters of the oils, which is given briefly in the following:

Eucalyptus eugenioides, or "White Stringy-Bark," yields from 0.6 to 0.7 per cent. of the crude oil, which contains 28.4 per cent. of eucalyptol, 34.8 per cent. of a second fraction, and is free from phellandrene. It also contains no eudesmol nor other constituent of special interest, so far as the authors have been able to determine.

Eucalyptus capitellata, or "Brown Stringy-Bark," yields an oil containing besides a mere trace of phellandrene, 38.4 per cent. of eucalyptol, and very little, if any, eudesmol.

Eucalyptus piperita.—It was in the oil from this species that *eudesmol* (which see under "Organic Chemistry") was first observed by the authors, this stearopten having formed on the cork of the bottle containing the oil. The yield of oil is 0.78 of crude oil. The fraction between 110° and 190° C. contains phellandrene, and only 25 per cent. of eucalyptol, and the oil rectified below 190° C. contains no eudesmol.

Eucalyptus punctata yields an average of 0.79 per cent. of oil, the crude oil containing from 50 to 60 per cent. of eucalyptol. It does not contain phellandrene, but traces of cuminic aldehyde. It appears to contain both dextro- and lævo-rotary terpenes, which vary in proportion according to the age of the leaves. But

Eucalyptus Macrorhyncha, or "Red Stringy-Bark," is considered by the authors the most important commercial tree of the genus. It yields from 0.28 to 0.31 per cent. of oil, and this yields about 50 per cent. of eucalyptol. The oil contains only a trace of phellandrene, but a large quantity of the crystalline stearopten, eudesmol, especially when the oil has been distilled in November. This represents the fraction boiling between 269° and 289° C., and forms about 27 per cent. of the original oil. It appears to interfere with the estimation of eucalyptol by the phosphoric acid process. The authors point out that the oil of *E. macrorhyncha* answers all the tests of the B. P., except sp. gr., which is 0.905 at 18° C., and that if this factor is insisted on, it will exclude the use of an oil which is excellent and agreeable and contains one-half its weight of the important constituent, eucalyptol. Finally, the authors find that the constituents of the eucalyptus oils do not appear to vary much in the same species, but the proportions vary according to the time of year at which the leaves are collected.—Pharm. Journ., Sept. 30, 1899, 315.

Pomegranate Bark—Isolation of a New Alkaloid.—A. Piccinni has isolated a new alkaloid, which is liquid, from pomegranate root bark. He finds that in the preparation of methylgranatonine (pseudo-pelletierine) an oily mass remains after crystallization from petroleum ether. From this oily mass the author has separated the liquid alcohol, which has the composition of $C_9H_{18}ON$, and differs from Tanret's methylpelletierine in that it is miscible with water. It is a tertiary alkaloid of a ketonic character, and possibly may be considered as a "nucleus homologne" of the hygrine of

Liebermann and Cybulski.—Pharm. Journ., Mar. 10, 1900, 249; from Pharm. Ztg., *44*, 870.

ROSACEÆ.

Wild Cherry Bark—Deterioration by Age.—A. B. Stevens reports the results of examination of 20 specimens of wild cherry bark collected at different periods since 1894. An estimation of the hydrocyanic acid was made in March, 1898, and repeated with the same sample in March, 1899, the method being that heretofore given by the author (see Proceedings, 1896, 216). The results show a uniform diminution in the percentage of hydrocyanic acid, and point out that the bark is best preserved in its whole, unpowdered state, and in glass or other air-tight containers. It follows that the galenical preparations of wild cherry are best made from the fresh bark; but even here there appears to be a large element of chance. So, for instance, the bark from large branches collected in May assayed in one sample 0.0675 per cent. and in another it assayed 0.1699 HCN, while the bark from small branches assayed in the one case 0.0458 per cent. and in the other 0.0755 per cent. HCN.—Pharm. Review, Oct. 1899, 445–446.

Spiraeas — Glucosides and Enzymes in Different Species. — M. W. Beijerinck has made some interesting investigations concerning the glucosides and enzymes in the roots, rhizomes and herbaceous portions of different *Spiræas—S. ulmaria, S. filipendula, S. palmata* and *S. Kamchatica.* The three first named contains besides the glucoside "gaultherin," which was first noticed by Procter (1849) in *Betula lenta*, L., an enzyme "gaultherase," which reacts with the gaultherin to form methyl salicylate. *S. Kamchatica* also contains both of these bodies in the older roots, but in the younger roots it contains a new glucoside

Spiræin, which by hydrolysis with gaultherase yields the salicylic aldehyde, first obtained by Pagenstecher (1834 from the flower of *Spiræa ulmaria*. The author obtained the new glucoside by a process identical with that for obtaining gaultherin, which is as follows: The roots are carefully cut into discs so as to avoid the rupture of the tissues, and gradually added to strongly boiling water, or to boiling alcohol, whereby the enzyme is destroyed, while the glucoside is dissolved unchanged. Upon evaporating the alcoholic solution it is obtained in an amorphous, more or less impure condition. The enzyme,

Gaultherase is obtained from the living roots of *Spiræa filipendula* by pounding and triturating to complete disintegration in a mortar, either at the temperature of the room or gently heated. During this operation the glucoside is completely hydrolyzed by part of the enzyme. The pasty mass is then extracted with alcohol, and the residual pulp dried at the ordinary temperature and powdered. On extracting this now odorless powder with water, and adding alcohol to the solution, a precipitate is

obtained, which on drying consists of more or less pure gaultherase. When a portion of this enzyme is added to either of the glucosides in the presence of water, methyl salicylate or salicylic aldehyde is formed, according to the glucoside employed.—Pharm. Centralh., Aug. 32, 1899, 534; from Centralbl. f. Bakter., etc., 1899. 425.

Flores Kouso—Unsatisfactory Quality as Supplied in German Pharmacies.—Oscar Kösters has examined specimens of kouso, flower and powder, obtained from pharmacies in different localities in Germany, and found them all more or less adulterated or of impure quality. They contained, with few exceptions, male flowers, axils and petiole fragments, along with other impurities, in form of leaves, straw, etc., in variable quantities, as shown by the following percentage of foreign substances determined: 24, 31, 9.2, 34.3, 21, 23.2, 43.7, 27, 19 and 22.1 per cent. The author observes that it has been difficult to obtain a good quality of kouso for a number of years, and that the sort in bundles has been almost unobtainable. Since the middle of last year, however, good qualities, in bundles, have been obtainable in moderate quantities, but at a relatively high price. —Pharm. Ztg., April 21, 1900, 306.

LEGUMINOSÆ.

Senna Leaves—Present Commercial Condition.—In the course of his description of the specimens of the different kinds of senna in the Museum of the British Pharmaceutical Society, Dr. E. M. Holmes makes some remarks concerning the drug as it occurs in the market, which may be accepted as authoritative. Argel leaves, formerly so commonly admixed with *Alexandria Senna* (*Cassia acutifolia*), are more rarely or only at long intervals found in them, and senna pods and flowers not at all. The argel leaves appear to be added, when at all, at an Egyptian central depot, for the purpose of giving the senna a better odor, since they are bitter, not purgative, and do not cheapen the senna. Of the other adulterants—*Tephrosia apollinea*, *Colutea arborescens*, *Coriaria myrtifolia* and *Globularia alypum*, none practically occur, though the latter is said to have appeared once in Germany as a substitute as "Wild Senna." Different grades of Alexandria senna, however, do exist, their relative value being as follows: The sifted and "elect" senna are about twice the value of the crude drug, and the hand-picked three-and-a-half to four times its value. The siftings, or small senna, is worth about half the value of the crude drug, and, judging from the prices, the powdered drug is probably made from the sifted drug or from the siftings, according to prices. According to the Consul at Suakim, senna is there sorted into picked leaves, broken leaves, and pods, the latter being exported chiefly to Trieste, and are used for imparting a gloss to silk fabrics. Latterly, the medicinal use of the pods, though well known to the Arabian and mediæval physicians, has been revived. The infusion is said to be milder in odor and taste and

slower in its action than that of the leaves, but equally effective. The best quality of Alexandria senna comes from Rowayyah, inferior kinds from Sinkat and Erkoweit. *Tinnevelly senna*, the *Bombay* or *East India senna*, and the *Arabian*, *Mecca* or *Aden senna*, are the leaflets of *Cassia angustifolia*, Vahl, though the name of "Aden senna" is sometimes given to the leaflets of *Cassia holosericea*, the leaflets of the latter, according to John Moss, being equally effectual with the Alexandria drug, but producing no gripings. Usually four or six grades of *Tinnevelly senna* are kept by wholesale druggists, differing in value according to size, color, etc. They are graded by sifting the leaves through sieves of different meshes. At one time the leaflets of *Cassia obovata* were mixed with the Alexandria drug, and were official in the B. P., 1867, but they do not now occur. They have the reputation of being less active than the leaflets of *Cassia acutifolia*. The leaves of *Cassia marilandica*, represented in a specimen in the Museum, are not unlike those of *C. obovata*, but are thinner, and are characterized by the upper epidermis having no stomata, epidermal cells with sinuous walls, and by the absence of hairs.— Pharm. Journ., March 3, 1900, 226.

Alexandria Senna—Recent Spurious Importation.—In an interesting contribution on "Spurious Alexandria Senna," Henry G. Greenish observes that from the perusal of the text-books of materia medica it would appear that Alexandria senna is liable to adulteration with a considerable variety of foreign leaves. As a matter of fact, however, the occurrence of those mentioned—*Solenostemma Argel* Hayne, *Tephrosia Apollinea* Link, *Coriaria myrtifolia* Linn., *Colutea arborescens* Linn., etc.—or substitution of them for that drug is at the present time extremely rare, the one time most common mixture, argel leaves, having now disappeared. One should, therefore, be very careful in handing down these leaves from year to year and generation to generation as adulterants of senna, conveying the impression that they are at least likely to occur. It would seem more expedient to attempt to confine the attention of the student to the drug itself, and to compel him to study this in all its details. He would then be in position to detect not only such adulterations or substitutions as have already been observed, but such as may occur at any future time, and these should then be recorded in the current literature and specimens preserved in museums for reference. The principal admixture of Alexandria senna observed by the author at the present time has been an occasional leaflet of

Cassia Obovata, Collad., but these have been so few as to be interesting rather than important. It sometimes also happens that the leaflets of *Cassia angustifolia*, Vahl., collected in Arabia, find their way to London under the name of Alexandria senna. Very recently, however, a considerable quantity of a drug imported from Suez has been offered on the London market as Alexandria senna, which in shape and general character of the leaflets agrees well with *C. obovata*, Collad. It resembles

Alexandria senna in color and general appearance, but is easily distinguished by the shape of the leaflets, which are sharply characterized by their obovate outline, rounded mucronate apex, and distinct pinnate venation. The upper surface is glabrous, but the lower distinctly pubescent. They attain 2 Cm. in length by 1 Cm. in breadth, but are usually a little smaller. They have the odor of senna, and a similar but rather mucilaginous taste. The drug contains a few stalks, but no flowers, fruits or foreign leaves. A microscopic examination, made with the view to ascertain whether the presence of these leaves in powdered senna could be detected, confirms the possible identity of this spurious senna with *C. obvata*, and that in the powdered state there is no difficulty to distinguish this spurious senna from the Alexandria senna. These characters of distinction are described and shown in illustration, which see in Pharm. Journ., Nov. 18, 1899, 470–471.

Acacia—Detection of Dextrin in the Powder.—Robert G. Shoults, in endeavoring to devise some means whereby the presence of dextrin might be established when admixed with powdered acacia, found that the behavior of gum arabic towards the usual reagents so nearly corresponded to the reactions of commercial dextrin that it seemed next to impossible to distinguish them by qualitative tests alone. He, moreover, finds the statement in the U. S. P., 1890, that acacia will not reduce alkaline cupric tartrate V. S. to be manifestly incorrect, in the light of his experiments recorded in the present paper. Slight reducing action manifests itself at the temperature of the water bath in a sample of acacia very finely powdered by hand, but if the supernatant liquid be filtered off and boiled, much heavier precipitates are obtained than in the first instance. This peculiar action of the powdered gum has by Schroeder (see Proceedings, 1897, 556) been attributed to the drying preparatory to powdering, but the author's experiments go to show that the process of powdering itself will produce this change in the nature of the gum without the application of artificial heat. Summing up the results of his experiments, it would seem that qualitative tests alone are of little value. It seems likely that if dextrin is used at all for the purpose of adulterating acacia powder, which the author doubts, it would be a very white sort. Such a white dextrin is liable to contain a large percentage of unconverted starch, and this would be easily detected by its insolubility and by iodine T. S. A high specific rotatory power for the sample, however, would be indicative of the presence of dextrin, since the optical rotations of the two substances differ widely from each other. That of a solution of pure acacia was found to be —18°, while that of a very white sample of dextrin, containing much unconverted starch, was + 102°, and that of a yellow sample, readily soluble in water, had a rotatory power of + 138°.—Amer. Journ. Pharm., June, 1900, 267–270.

Gum Arabic—Detection and Estimation of Added Gelatin.—Trillet

recommends formaldehyde for the detection of gelatin, particularly in gum arabic. The gum is dissolved in water, the solution decanted clear, evaporated to syrupy consistence, and mixed with 1 Cc. of formaldehyde (1 Gm. of gum being employed initially ? Rep.). After evaporation to a pasty consistence, the product is treated repeatedly with hot water, which dissolves the gum and leaves the gelatin as a horny sediment. The quantity of the latter is ascertained by drying, as is the gum after evaporation of its mixed solutions. The method may also be employed for the estimation of gelatin in jellies. In presence of albumen this must be removed first by coagulation and straining. In all cases the solution containing the gelatin must be concentrated to a syrupy consistence before adding formaldehyde, which produced no precipitates in dilute solutions.—Pharm. Post, Nov. 12, 1899, 629: from Compt. Rend.

Syrian Tragacanth—Chemical Investigation.—Dr. Hilger and W. Dreyfuss have subjected Syrian tragacanth (both vermicular and in flakes) to chemical investigation, and report the results in a paper read before the Convention of German Naturalists and Physicians (Sept. 19, 1899). They find it to be insoluble in cold water even after contact for months, and that at a boiling temperature not more than 2 per cent. of its substance is dissolved, this consisting of soluble starch, dextrin and invert sugar. Tragacanth is essentially a single colloidal carbohydrate, properly named bassorin. It yields 2.68 to 3.1 per cent. of ash, composed of potassium carbonate in small proportion, potassium chloride, calcium phosphate, magnesium-ferric phosphate, and calcium carbonate. This composition of the ash precludes the assumption that the bassorin exists in combination with inorganic matter. It contains from 9.2 to 15 per cent. of water, an average of 3 per cent. of cellulose. By hydrolysis with 2 per cent. sulphuric acid it yields galactose and arabinose, the proportions varying according to the kind of tragacanth, as follows:

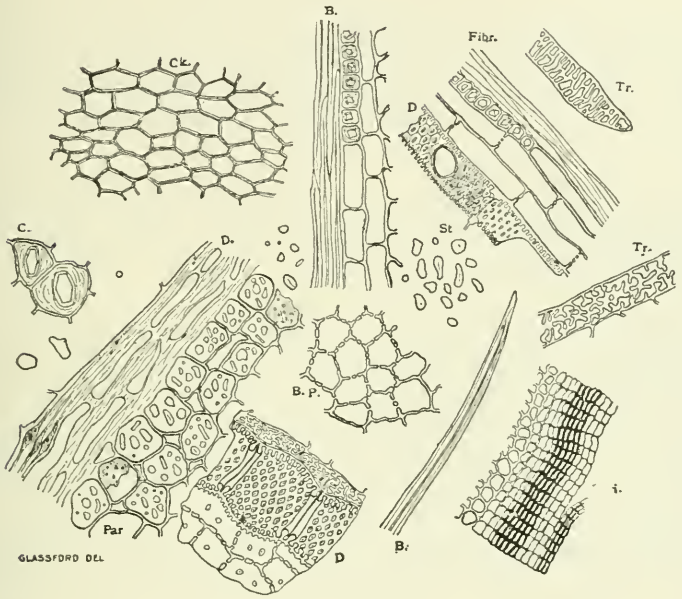
Vermicular	= galactose.	19.5 per cent.;	arabinose, 64.9 per cent.
Flakes	= "	17–18 per cent.:	" 36.7 per cent.
Tuberous	= "	29.9–32.8 per cent.:	" 29–32 per cent.

Tragacanth is gradually dissolved completely by cold potassium hydrate solution of about 15 per cent., and alcohol precipitates from this solution a dextro-rotatory body possessing reducing properties. The composition of bassorin demands the formula $C_{11}H_{20}O_{10}$.—Apoth. Ztg., Sept. 29, 1899, 575.

Licorice Root—Histological Elements of the Powder.— Prof. Smith Ely Jelliffe, after a morphological and histological description of licorice root, gives the following description of the principal characteristic elements of the powdered root, shown by Fig. 70, as follows: The starch grains are small, from 0.0015 to 0.03 Mm. in diameter, round or irregular, and usually single. Portions of the large pitted and net-veined ducts are frequent,

also the calcium oxalate crystals in their peculiarly thickened cells accompanying the bast and wood fibers. The masses of obliterated sieve tissue

FIG. 70.



Licorice Root —*Tr*, tracheids, showing peculiar markings; *D*, ducts, showing diamond-shaped pits; *Fibr*, wood fibers bordered by cells containing calcium oxalate crystals; *B*, bast fibers bordered by cells containing calcium oxalate crystals; *C*, *O*, calcium oxalate crystals, enlarged, showing the thickening of the containing cells; *D*, degenerate sieve tissue; *Par*, parenchyma from bark, showing starch; *B P*, pitted parenchyma from bark; *Peri*, periderm in longitudinal section; *St*, starch grains; *Ck*, cork, viewed from the surface.

and the patches of angular cork cells are worthy of mention. The absence of the latter serves to distinguish the Russian variety, to which end also its larger-celled parenchyma is of some value. — Drugg. Circ., June, 1900, 112.

Licorice Root—Presence of a Volatile Oil.—The interesting statement is made in a recent report of the firm of Heinrich Hänzel that licorice root will yield a volatile oil by distillation, although only in extremely small amounts, Spanish root yielding 0.03 per cent. and Russian 0.035 per cent. Owing to the small quantities obtained, the oils could not be subjected to intelligent examination. The two oils are not identical, however, that obtained from Russian licorice root being dextrorotatory, whilst the product from the Spanish root was lævogyre. Both oils give a faint acid reaction, and are soluble in diluted alcohol in proportions not determined. Pharm. Centralh., Aug. 31, 1899, 533.

Kino—Commercial Quality.—Cæsar & Loretz (Geschäftsbericht, Sept. 1899) report the results of examination of nine lots of kino, as follows:

	1	2	3	4	5	6	7	8	9
	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
Soluble in 90 per cent. alcohol	97.94	97.60	97.24	96.67	96.74	97.70	93.54	97.43	89.67
Soluble in water	86.00	97.07	96.48	97.57	95.86	91.43	89.07	96.99	90.89
Tannin	60.38	59.31	53.17	47.60	58.51	58.32	55.20	52.73	43.82
Ash	2.79	1.26	0.77	1.11	1.68	0.53	0.91	0.80	6.23
Mixture	12.24	17.57	17.11	16.91	17.24	17.72	8.51	10.87	12.18

With the exception of No. 9, which was an undetermined African variety of kino, the samples were all the best commercial varieties obtained from *Pterocarpus marsupium* and *P. erinaceus*.—Pharm. Review, Nov. 1899, 522.

Malabar Kino—Tannin Value.—David Hooper has determined the tannin value of a number of specimens of Malabar kino, which is derived from *Pterocarpus marsupium*, a tree more abundant than anywhere else in the Malabar district of the Madras Presidency. When the kino exudes from the tree it is a thick red liquid yielding about 50 Gm. of dry kino from 100 Cc. During the process of evaporation the drug breaks up into the peculiar angular fragments by which it is known in commerce. The hide powder process was used in the determination of the following nine samples of kino. They were all collected by forest officers, and although not all from Malabar, they were obtained from the official botanical source.

	Water.	Tannin.	Non-tannins.	In-soluble.	Ash.	Tannin in Dry Substance.
1	15.3	79.1	4.1	—	1.5	93.2
2	14.6	82.4	1.6	0.4	1.0	96.5
3	14.9	78.4	4.6	1.0	1.1	92.1
4	15.7	79.0	3.8	—	1.5	93.7
5	14.7	79.5	4.2	—	1.6	93.2
6	15.7	79.6	1.1	1.3	2.3	94.4
7	13.5	76.4	4.0	4.0	2.1	88.3
8	15.1	70.0	11.5	1.5	1.9	82.4
9	12.2	70.4	10.6	5.1	1.7	80.2

The astringent character of Malabar kino is very marked according to these results. Eliminating the last three, which were derived from the central provinces and collected as an experiment, the yield of tannic acid in the dry substance is over 90 per cent. The tests were made on fresh specimens of dried juice, which probably accounts for their superiority.—Pharm. Journ., March 3, 1900, 226.

Butea Kino—Character and Commercial Quality.—David Hooper calls

attention to the recommendation to introduce Butea (or Bengal) kino into the colonial Addendum to the B. P., 1898, for use as an equivalent of the official Malabar kino (from *Pterocarpus marsupium*), and in this connection describes its character and gives the results of a proximate examination of samples from different localities and of different ages. The Butea kino is obtained from the Dhak, Palás, or Bastard Teak Tree, *Butea frondosa*, Roxb., a tree very common in Central and Northern India. It has the reputation among many writers, due to Dr. Roxburgh, who first described it, that it approaches Malabar kino in its perfect solubility in pure water, and in consequence found a place in the "Pharmacopœia of India." According to Mr. Hooper's experience, however, this reputation is not well founded. As supplied, owing to carelessness or ignorance in collection, and from other more or less natural causes, such as the greater tenuity of the exudation and consequent congelation into small tears and masses, it is a very impure product, containing besides the bark of the tree, stone, dirt, foreign seeds, sticks, leaves, and what not. The following seven samples were submitted to analysts during the past year. The moisture and ash were first determined in the usual manner. A portion of each specimen in a powdered condition was next extracted with alcohol of 90 per cent. to dissolve out the available tannin, and this principle was determined in the aqueous solution of the residue of the extract after evaporating off the spirit. The insoluble matter was calculated by difference.

	Water.	Tannin.	Non-Tannins Soluble.	Insoluble.	Ash.
1. Garhwal, N. W. P.	10.15	15.45	3.55	42.95	35.70
2. Saharanpur, N. W. P.	14.35	23.10	10.90	46.10	5.55
3. Lucknow, N. W. P.	12.60	30.05	10.60	36.35	10.40
4. Ganjam, Madras	14.05	35.30	8.50	36.40	5.75
5. Bengal	11.20	27.70	9.80	19.50	31.80
6. Rajputana	13.40	34.70	10.70	28.95	12.25
7. Panjab	13.30	62.20	7.65	9.90	6.95

Nos. 1–3 were from the collection in the Indian Museum, Calcutta, the first having been in store for about 17 years, the other two since 1894; No. 4, was received by the author in 1898, and was apparently freshly collected; No. 5 was from a Calcutta drug bazaar, and contained gross impurities, as did also No. 6, from a bazaar in the Pachbadra Salt Region. The last, the Panjab sample, was in bright red tears, with a certain admixture of brown corky bark and dried muddy particles, and was apparently of recent collection. Some experiments were also made by the author in order to determine whether a tincture made from Butea kino, like that from Pterocarpus kino, was liable to gelatinize, sample No. 7 being employed for this purpose. Tinctures were prepared with 90 per cent. alcohol, with alcohol

containing 25 per cent. volume of distilled water, and diluted spirits consisting of equal volumes of 90 per cent. alcohol and water. The first was turbid, the second and third were clear and deep red. On exposure in beakers, loosely covered, the first showed evidence of solidification, the second became somewhat thicker than when first made, while the third retained its original limpidity.—Pharm. Jour., June 23, 1900, 664–665.

Copaiba — Criticism Concerning the B. P. Tests and Characterization. —F. W. Short observes that the figures in one of the B. P. requirements concerning the character of copaiba, viz., "the volatile oil should . . . . rotate the plane of a ray of polarized light from 28° to 34° to the left (absence of African Copaiba)," have apparently been taken from a paper on African Copaiba by J. C. Umney (see Proceedings, 1891, 633), in which he gives —28° 55′ and —34° 18′ as the rotatory powers of two samples, Para and Maracaibo respectively. Mr. Umney, however, does not state that these figures represent the highest and lowest of a series, but conveys the impression that they are only two isolated samples; moreover, although not so stated in the table given, it is mentioned in the text of the paper that they refer to the rotation in a 20-centimeter tube. If, therefore, as seems to be the case, the compilers of the Pharmacopœia took their figures from the above source, the latter should at any rate be halved. Even then they will probably be too narrow; the figures given by Gildemeister and Hoffmann range from —7° to —35°.—Pharm. Journ., Jan, 20, 1900, 54.

Surinam Copaiba—Characters and Distinction from Other Sorts.—According to Pool copaiba is obtained in Surinam from *Copaifera Guianensis* and other species of *Copaifera*. It is a clear, yellow liquid, having the consistence of olive oil, and differs from the thick-liquid copaibas of commerce in being readily soluble in petroleum ether. It is also soluble and miscible in all proportions with chloroform, ether and carbon disulphide, and forms a turbid mixture with an equal volume of absolute alcohol, but a clear solution with 4 to 5 parts. Its sp. gr. at 15° C. is 0.942, and it gives the following constants: Saponification number, 34; 1 Gm. absorbs 0.094 Gm. of iodine. It contains 78 per cent. of a colorless volatile oil, sp. gr. 0.910, boiling point 250°–260° C., the resinous residue of distillation yielding crystals of copaivic acid to diluted alcohol. It forms a clear solution with one-third of its volume of ammonia water, and gives a handsome violet color reaction when a solution of bromine in chloroform (1 : 20) is added to it, while the oil under the same conditions develops a pure red color.—Pharm. Centralh., Aug. 17, 1899, 503; from Nederl. Tijdschr. voor Pharm.

Balsam of Peru—Variable Composition of Cinnameïn.—At the meeting of German Naturalists and Physicians (Sept. 19, 1899), Prof. Tschirch communicated the results of a chemical investigation of cinnameïn

which demonstrates that this component of balsam of Peru does not always have the same composition, although it is always composed preponderatingly of benzoic acid-benzylester, mixed with more or less of cinnamic acid-benzylester. The author also exhibited some crystallized

Myroxocarpin, $C_{48}H_{52}O_6$, m. p. 115° C., isolated from a specimen of white balsam of Peru in the collection of the late Prof. Flückiger. This body was discovered by Stenhouse in 1851, but had not since been obtained by other experiments.—Apoth. Ztg., Sept. 27, 1899, 572.

H. Thoms has also studied the chemical constituents of balsam of Peru. He finds that

Cinnamein consists of the benzoic and cinnamic esters of benzyl alcohol, and a hitherto unknown alcohol possessing a sweet odor and taste, and having the formula $C_{13}H_{22}O$, to which he gives the name

Peruvol.—This body is probably the so-called cinnamyl alcohol isolated by Delafontaine, which the author failed to detect in balsam of Peru. All the samples of balsam examined contained vanillin, but neither iso- or allo-cinnamic acid were found. The author, however, separated

Dihydrobenzoic acid, which has a melting point of 79°–80° C. The ratio of cinnamic to benzoic acid in eight samples of balsam was as 40 to 60.—Pharm. Journ., Oct. 21, 1899, 377 ; from Chem. Ztg., *24*, 236.

Balsam of Peru—Examination of Commercial Specimens.—Cæsar & Loretz report the results of examination of thirteen specimens of balsam of Peru obtained from reliable sources, and of two samples which were of doubtful purity. The specific gravity of the pure samples ranged from 1.137 to 1.154 at 15° C. On treatment of these samples with nitric acid in the presence of petroleum benzin, a pure yellow mass was produced with nine of the samples, a brownish mass with three, and a greenish-yellow mass with one sample. The percentage of cinnamein varied from 57.80 to 66, only two specimens being below 60, while five were above 64 per cent. The ester number varied from 229 to 244, and the amount of resin between 16 and 24.5 per cent. The two doubtful samples had a sp. gr. of 1.149 and 1.156, the ester number was 212 and 215, and the resin amounted to 19.47 and 22 per cent. respectively, while with nitric acid they both gave a greenish yellow coloration. Little value is attached to the estimation of resin, the data of value being : 1. A sp. gr. from 1.136 to 1.150. 2. The formation of a yellow or brownish-yellow mass with nitric acid. 3. The percentage of cinnamein should not be less than 60, and the ester number of the cinnamein should be at least 236. In making the nitric acid test, the acid should have the sp. gr. 1.36, and the petroleum benzin must be free from benzene.—Pharm. Review, Nov. 1899, 523.

Balsam of Tolu—Experiments to Distinguish Natural from "Exhausted" Balsam.—J. Spilsbury and T. G. Joyce find that whilst the quan-

titative process quoted in the B. P., 1898, distinguishes between a spurious and a genuine sample of balsam of tolu, it is inadequate for determining an exhausted or a mixture of an exhausted and a genuine one. Selecting for their experiments five samples, one of them (No. 1 in the table) a sample of balsam from which syrup had been manufactured, and for convenience called "exhausted," the remaining four represented to them as genuine balsam, the authors obtained the results exhibited in the following table by the official method of examination:

	Percentage of Cinnamic Acid in Balsam.	Percentage of Balsam Soluble in CS_2.	Character of Residue Soluble in CS_2.	Saponification Number of CS_2 Residue.	Percentage of Ash from Balsam.
1..	11.5	12.28	Crystalline.	357.2	0.27
2..	20.2	26.95	"	282.5	0.33
3..	20.8	27.32	"	286.9	0.32
4..	20.2	23.88	"	318.8	0.30
5..	—	47.12	Transparent resinous.	266.2	0.57

The saponification number represents the parts of potassium hydrate consumed by 1000 parts of the residue soluble in carbon disulphide. Braithwaite considers that this number should not fall below 300 in the case of good balsam. While the experiments have not come to a definite conclusion, the results point out that a standard of 18 per cent. of cinnamic acid should be the lowest official requirement. — Pharm. Journ., Feb. 3, 1900, 93–94.

Araroba—Commercial Quality.—According to the B. P., 1898, araroba is admitted to be an admixture of chrysarobin and foreign matter, such as fragments of mud, etc., and not, as in the 1885 condition, a substance identical with chrysarobin. It should yield not less than 50 per cent. of the latter to hot chloroform. Edwin Dowzard, who has examined nine commercial samples of araroba, observes that this requirement is too low. The wood samples examined contained about 8 per cent. of sand and 20 per cent. of twigs, but yielded when dried and powdered—as required by the B. P.—51. 8per cent. of chrysarobin. Araroba containing 65 to 75 per cent. of chrysarobin is readily obtainable, and it would be advisable to make 65 per cent. the minimum figure. As imported, araroba contains a large proportion of water—from 14 to 30 per cent.—which appears to be purposely added to prevent the irritating dust of the powder from rising; but 15 per cent. is enough for this purpose, and when the amount reaches 25 or 30 per cent., it must be considered an adulteration. Pure dry araroba contains from 70 to 85 per cent. of chrysarobin and 0.3 to 3.0 per cent. of ash.—Trans. Brit. Pharm. Conf., 1890, 442–443.

Tonka Beans—Cultivation in Venezuela.—Dr. Preuss communicates

some interesting information concerning the cultivation of tonka beans, which he had opportunity to witness on a plantation at Borburato in Venezuela. The tolerably large trees have a full crown and magnificent dark-green foliage. From the violet-colored butterfly-shaped flowers elongated fruits are developed, which are of about the size and resemble in shape the fruits of the mango. The brown-violet, long, flat seeds—the tonga-beans—are embedded in a yellow pulp, which has a somewhat unpleasant odor, and is encompassed by a strongly fibrous, hard shell. It was asserted that a mature tree is capable of yielding 100 pounds of the seeds, but the author believes this to be an exaggeration. The plant (*Dipterix odorata*) apparently requires the same conditions of climate, soil, etc., as does cacao, with which it is planted customarily because of the shade it produces and which is required by the latter; but it is said to do equally well upon the dry mountains of Venezuela, the only country, so far as known to the author, in which it is cultivated. The seeds ripen during the month of August but evidently the harvest extends over a considerable period, since fruits and blossoms are found on the trees at the same time. The wood is highly valued for a variety of purposes.—Apoth. Ztg., Jan. 20, 1900, 48; from Tropenpflanzer, 1899, 574.

Locri Bark—Proximate Constituents.—W. P. U. van den Driessen Mareeuw has subjected "locri bark," which according to J. F. Pool is derived from *Hymenæa Courbaril*, and is used by the natives of the West Indies as a remedy in dysentery, to proximate examination. It is a very hard bark, about 1 Cm. thick, light brown on the outer surface and covered with much moss, the inner surface being dark brown and smooth, and has a fibrous fracture. The powdered bark was extracted successively with petroleum ether, anhydrous ether, and absolute alcohol. The petroleum ether contained the *fat*, amounting to 0.634 per cent. The ether extract yielded white crystalline needles, having an acid reaction, nearly insoluble in cold water, but easily soluble in warm water and in alcohol, glacial acetic acid, alcohol, ether-alcohol and acetone. They were identified to be *catechin*, and amounted to 2.744 per cent. The alcoholic extract yielded 23.804 per cent. of *catechu-tannic acid*. The *ash* amounted to 7.59 per cent. of the bark, and was composed to the extent of 65.4 per cent. of lime, and 34.6 per cent. potassium and sodium carbonates.—Apoth. Ztg., Sept 2, 1899, 524.

Prosopis Strombulifera—Medicinal Use of the Fruits.—Attention is directed in "Merck's Annual Report" (1899) to a new drug from Argentinia, which consists of the fruits of *Prosopis strombulifera*, Benth., and is known by the names of Retortuna, Mastuerzo, Mastorcido, and Pata de Gallo. The fruits possess astringent properties and are used in form of aqueous infusions, internally and externally, in diarrhœa and gonorrhœa. Pharm. Ztg., March 10, 19 0, 190.

Genista Tinctoria—Coloring Matters.—A. G. Perkin and F. G. New-

bury have isolated two distinct coloring matters from dyer's broom (*Genista tinctoria*), one of which is identical with the luteolin of weld (*Reseda luteola*), while the second is a new coloring matter, which the authors have named

Genistein.—This has the composition $C_{14}H_{10}O_5$, occurs in colorless needles, and in dyeing property closely resembles apigenin and vitexin. It yields an acetyl derivative, $C_{14}H_7O_5(C_2H_3O)_3$, m. p. 197°–201° C., and a tetrabromo compound, $C_{14}H_6Br_4O_5$, in colorless needles melting above 290° C. On decomposition with alkali, it gives phloroglucinol and an acid of the formula $C_8H_8O_3$, m. p. 147°–149° C., and this, with fused alkali forms parahydroxybenzoic acid. It appears to be parahydroxyphenylacetic acid. —Pharm. Journ., July 8, 1899. 25; from Proc. Chem. Soc., *15*, 179.

Lotus Arabicus—Hydrocyanic Acid the Cause of its Toxity.—Wyndham R. Dunstan and T. A. Henry have determined the constituents of *Lotus Arabicus*, a small leguminous plant resembling a vetch, indigenous to Egypt and northern Africa. It is known to the natives as "khuther," and old plants with ripe seed are used as fodder; but at certain stages of its growth it is highly poisonous to horses, sheep and goats, this property being most marked in young plants up to the period of seeding. The authors found that when the leaves are moistened with water and crushed they evolve prussic acid in considerable quantity, the amount being greatest just before the flowering period and least just after. The prussic acid originates in a yellow crystalline glucoside, which the authors have named

Lotusin ($C_{22}H_{19}NO_{10}$), under the influence of an enzyme, which they have named *lotase*, a new coloring matter,

Lotoflavin ($C_{15}H_{10}O_6$), being also a product of this reaction. The latter is also isomeric with "luteolin," the yellow coloring matter of *Reseda luteola*, and with "fisetin," the yellow coloring matter of *Rhus cotinus*.—Chem. News, June 29, 1900, 391.

Lentils—Relative Economic Value of Large and Small Seeds. — Dr. P. Süss has made a series of experiments to determine the relative economic value of the more expensive large and of the cheaper small lentils, the former, usually regarded as superior, costing on the average about 0.37 mark, when the smaller variety can be bought for about 0.27 mark. Assuming that the nutrient qualities reside mainly in the interior portion of the seeds, the method of examination consisted mainly in determining the relative percentages of the seed-coats of the two kinds, as follows: 50 Gm. of the lentils were covered with 500 Cc. of hydrant water in a capacious beaker and protected by an asbestos-net, were boiled over the direct flame until the seeds could be easily mashed by pressure under the fingers on a porcelain surface. They were then reduced to pulp, and the seed-coats freed from the pulped interior by washing with a stream of water, spread upon

blotting paper, dried, heated to constant weight at 105° C., and weighed The results obtained with twelve samples of each of the two kinds of lentils showed that, contrary to what might have been expected, the percentages of seed-coat differed very little in the two kinds, though slightly greater in the smaller kinds, which contained 6.86 per cent., whereas the larger yielded 6.34 per cent. From an economic stand-point, therefore, the smaller kind is to be preferred, since it possesses practically the same amount of nutrient substance at a cost of 27 per cent. lower than that of the larger. Moreover, the smaller kind requires less boiling, becoming soft in from ¾ to 1 1/3 hour, while the larger requires from 1 to 1¾ hours. One hundred lentils weigh respectively 2.52 and 5.42 Gm. The percentage of moisture in both varies from 12 to 14.5 per cent. — Pharm. Centralh., July 20, 1899, 437.

TEREBINTHACEÆ.

Myrrh—Pharmacopœial Quality.—In examining a series of samples of myrrh obtained in the ordinary course of business, and variously described as "Sorts," "Sorts Elect," "Sorts Parv.," etc., but all included in the genera title myrrh, George F. Merson was struck by the widely dissimilar character of the samples, yet was unable, *from official data*, to say that they were other than what the B. P. directed to be used in the preparation of the tincture. He now records in the form of tables the results of the examination of a large number of samples, both whole and in powder, which will be found instructive and for the general guidance of pharmacists. The author summarizes his conclusions as follows:

1. Myrrh is easily obtainable of good quality, and is not adulterated to any great extent, except by the inclusion of earthy matter which can readily be removed by sifting.

2. The normal ash in good "sorts" does not exceed 5 per cent., which should be almost entirely soluble in dilute hydrochloric acid.

3. One Gm., when exhausted by 90 per cent. alcohol, should leave a residue which, when dried at 100° C., should not weigh more than 0.60 Gm.—Pharm. Journ., Jan. 20, 1900, 42–44.

Myrrh—Method of Distinguishing Different Sorts.—Rud. Hanke has experimented in order to establish a rapid method for determining the genuineness and purity of myrrh. He has determined the composition of the principal commercial sorts to be as follows:

Variety.	Herabol.	Bisabol.	Bdellium.
Gum	56–67 %	40–42 % soluble 10–15 % swellable	27–34 %
Resin	about 30 %	about 30 %	25 %
Soluble in petroleum ether	4.5–7.2 %	11.7–12.2 %	
Ash	3.1–4.7 %	5.6–6.3 %	

The examination of the drug is carried out as follows: About 2 Gm. of the coarsely powdered drug are vigorously shaken with 10 Cc. of absolute alcohol, while heating for a time, and then filtered. A drop of the tincture is evaporated in a watch glass and the residue moistened with concentrated nitric acid: *Herabol* and *bisabol* produce a red color; *bdellium*, no coloration. If 1 Cc. of the tincture is mixed with an equal volume of alcoholic lead acetate solution, turbidity or precipitation is immediately produced with *bisabol* and with *African bdellium*, with *herabol* after several minutes, and with *Indian bdellium*, not until after several hours.

1 Gm. of the drug is vigorously shaken with 10 Cc. of water with moderate heating, for several minutes, filtered, and 1 Cc. of aqueous solution of lead acetate added to the filtrate. Precipitates are produced with *herabol* and *bisabol*; none with *bdellium*.

10 Gm. of the drug are shaken frequently during half an hour with 20 Gm. of cold petroleum ether having a low boiling point. The filtrate is colorless in the cases of *herabol* and *bdellium*, but that from *bisabol* is yellow. If then 1 Cc. of filtrate is shaken with an equal volume of concentrated hydrochloric acid, the latter becomes purple-red with *herabol* and *bisabol*, but not, or only yellowish, with *bdellium*. Furthermore, on diluting 0.5 Cc. of the filtrate with 4 to 5 Cc. more of petroleum ether, and mixing 6 drops of this liquid with 3 Cc. of glacial acetic acid, the following reactions may be observed:

Bdellium, no coloration.

Herabol, a brown coloration develops at first at the line of contact of the two liquids, the intensity of this color gradually diminishing upwards, while the acetic acid layer assumes a green color in the course of half an hour, and on longer standing becomes magnificently violet (= herabol-reaction).

Bisabol, the entire liquid assumes a rose-red color, the coloration gradually becoming intenser, and, after long standing, reddish yellow (= bisabol-reaction).

A good sample of *Herabol-Myrrh* accordingly may be characterized by: 1. Distinct reactions with nitric and hydrochloric acid; 2. A colorless petroleum-ether extraction; 3. A distinct "herabol-reaction," under the above provision; and 4. Immediate precipitation of its aqueous solution by lead acetate, and of its alcoholic solution after several minutes. If all these reactions are obtained and the petroleum-ether extraction is yellow, the sample under examination is a mixture.—Ztschr. Oest. Ap. Ver., 1900, No. 10–12, 274.

Elemi—Commercial Genuine and Allied Sorts.—At the recent meeting of German Naturalists and Physicians (Sept. 18, 1899), Dr. Karl Dieterich exhibited and described a large number of commercial sorts of elemi, which are enumerated as follows:

I. *Genuine Elemi.*

a. Soft and hard:

1. Manila Elemi generally occurs soft, rarely hard, derived from *Icica icicariba.*
2. Yucatan Elemi (American or West Indian Elemi) is generally hard, seldom soft, and is derived from *Canarium commune* and *Amyris Plumieri.*

b. Hard only.

3. Mexican or Vera Cruz Elemi, from *Amyris elemifera.*
4. Rio Elemi, derived from several species of *Protium.*
5. Brazilian (Almessega) Elemi, from *Protium heptaphyllum.*
6. African Elemi, from *Canarium zephyricum.*

II. *Resembling Genuine Elemi.*

a. Having an odor resembling that of elemi, and nearly related to it.

1. East Indian Tacamahac, from *Calophyllum inophyllum.*
2. Bourbon Tacamahac, from *Calophyllum tacamahaca.*
3. Resina Anime, East and West Indian, from unknown species of *Burseraceæ.*

b. Having an odor resembling frankincense, and nearly related to the latter.

4. Cayenne Frankincense, from *Icica heptaphylla.*
5. Gomast Gum (also designated as mastic), from *Bursa gummifera.*
6. Resin of Occumé, from West African species of *Burseraceæ.*
7. West Indian Tacamahac, from *Icica heptaphylla.* ?

III. *Related externally to genuine Elemi, but distinct from it in their odor.*

1. Resina carauna, from Icica carauna.
2. Resina Kikekunemalo and Hyowæ, from unknown species of *Burseraceæ.*
3. Resina Hedwigiæ, from *Hedwigia balsamifera.*
4. Gum Copal, from *Darryodia hexandra.*

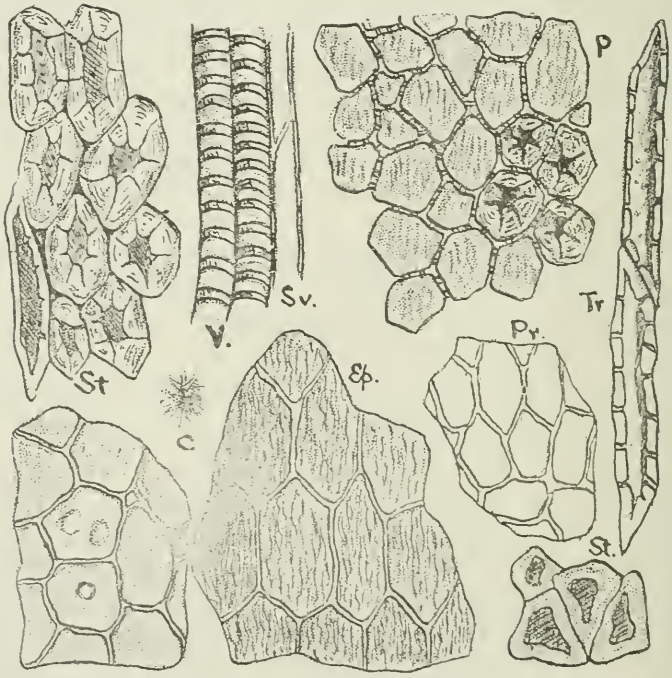
Manila elemi, the kind most abundantly found in commerce, is the only sort that has been examined with some degree of thoroughness. Next to the Manila comes the Yucatan elemi in commercial importance, but neither this nor any of the other sorts have been subjected to chemical examination. Dr. Dieterich now reports on the examinations made by him, using in each case the natural product, and not, as in the analyses heretofore made, an extract of the resins. The results of the very comprehensive experiments made, show that in the soft sorts of elemi the loss at 100° C. is, as should be expected, greater than in the hard kinds. The soft sorts also appear to have higher acid numbers, from which it may be concluded that the volatile oils are the carriers of the acid bodies, and that they are dissipated by volatilization during the conversion into hard resins.

The ash content of the elemis is trifling, and should not exceed 1 per cent. The genuine elemis have comparatively low acid and saponification numbers, this being already indicated by their sparing solubilities in alkalies. On the other hand, the elemi resins may be characterized as easily soluble bodies in the organic solvents, their solubility being best in ether, then in alcohol, carbon disulphide, chloroform, benzene and 80 per cent. chloral-hydrate solution, in the order named, while in benzin and petroleum ether they are least soluble. Unlike other resins, the resins of elemi are not saponifiable in the cold, hence the determinations of the acid numbers were effected by boiling for half an hour with $\frac{N}{2}$ potassium hydrate solution.—Apoth. Ztg., Sept. 23, 1899, 562.

PIPERACEÆ.

Cubebs—Microscopical Features of the Powder.—Prof. Smith Ely Jelliffe gives a description of the morphology and of the anatomical struc-

FIG. 71.



Cubebs in Powder. Ep, epidermis from upper surface; St, stone cells of the pericarp; P, parenchyma of pericarp with stone cells; Tr, tracheid-like stone cells of the stems; V and Sv, vessels of pericarp and of the stem; O, parenchyma with oil cells and oil globules; Pr, parenchyma of the seed; C, crystal-like bodies of fat or cubebin.

ture of cubebs, accompanied by cuts showing the principal anatomical features of the fruit in cross section and the prominent microscopical elements in the No. 50 powder, the latter being shown by Fig. 71. The

powder is of a gray-brown color. Its most prominent features are stone cells, oil globules, starch grains in the ripe fruit, crystalline masses and parenchyma. Less conspicuous are epidermal structures and fibro-vascular elements. The stone cells present a variety of shapes and sizes. Those of the inner row, *i. e.*, just outside of the seed coat, are the largest. These are usually oblong, sometimes three times as long as broad, and measure in the longest diameter from 50 to 75 micra. The smaller stone cells of the hypodermis average 25 to 35 micra. All of the stone cells are richly pored and many are brownish in color. The oil globules are very numerous throughout the entire powder. They are usually lying free, though occasionally not disturbed from the glands, which average 75 to 120 micra in diameter. The starch grains are found, well formed, only in the ripe fruit. They are very minute, averaging 1 to 5 micra, and are simple and compound in twos, threes and fours. The crystal masses are very distinctive, they vary greatly in size and are sometimes very common in the powder, at other times not. Specimens mounted in glycerin jelly will not be preserved, if the jelly in preparation is heated above 125° C. The parenchyma is usually thin-walled and very irregular; in the region of the pericarp many of the cells are pitted and the walls are thicker, the cells being somewhat smaller, 30 to 40 micra. The cells of the endosperm are thinner walled, average about 40 micra, and are not pored. Epidermal structures are distinctive though not prominent. The thickened walls which are finely striated are readily recognized. The fibro-vascular elements are not numerous, yet almost always present in any small field. Spiral vessels, tracheids, tracheid-like stone cells and short fibers are constant and some sieve tube elements may be found. The greater the quantity of stems the more vascular and fibrous elements are found.—Drugg. Circ., Aug. 1899, 172.

Kava—Present Mode of Preparation and Use.—C. G. Lloyd records his personal observations respecting the present mode of the preparation and use of Kava in Samoa, chiefly for the purpose of correcting two erroneous impressions about this beverage: 1st, that the Ava or Kava is now prepared by chewing the the root, which is the exception, not the custom in Samoa, and 2nd, that it is used as an intoxicating drink. It has no more right to be classed as an intoxicating drink with Samoans than coffee or tea with us. It is customary when a visitor calls at a native Samoan house to at once make for him a bowl of Kava, and should it happen that they have no root in the house they will apologize the first thing. He is informed that when it is taken in excess it will make the legs "drunk," though it has no effect on the brain; he saw no one under its influence, and the natives certainly do not use it in excess. Samoans prefer the drink made from the dried roots, these being pounded to a powder with a small boulder on the concave top of a larger boulder. Then the powder is put into a Kava bowl and the Taupon girl—meaning a virgin, and every village has a Tau-

pon girl who is always called on to make the Kava—after washing her hands pours water on the powder and thoroughly stirs with her hands for five or ten minutes. Then taking the fibres of the cocoanut husk or the fibre of the bark of the fan tree (*Hibiscus tiliaceus*), she strains the powdered root of the liquid, and the Kava is ready—usually straining each portion separately into a cocoanut shell, which is then passed by a boy to the person designated by the "talking man." Kava looks and tastes something like soapy water, but will quench thirst as water will not. When made from the green root, it is still made by first chewing the root to a pulp, and the author has drank it made in this way on two or three occasions; but this method is now rarely practiced.—Pharm. Rev., 1900, 261–266.

RHAMNACEÆ.

Ceanothus Americanus—Alkaloidal Constituents.—The root of *Ceanothus Americanus*, or red-root, a small shrub growing in many parts of this country, has been the subject of investigation by different authors, and so also by Gerlach, who obtained 0.5 per cent of an alkaloid in the form of a white granular powder which he named "ceanothine." H. M. Gordin has now also investigated the subject, assaying the root by different methods, avoiding the use of strong agents and effecting as complete exhaustion as possible, but failed to obtain in any case more than 0.2 per cent. of alkaloid. Moreover, the alkaloid obtained by Gerlach's method does not seem to be an individual compound, as by repeated solution in hot alcohol the melting point of the alkaloid which separates out on cooling does not remain constant. It would appear that the substance named by Gerlach "ceanothine" is in fact a mixture of an ether soluble and an ether non-soluble compound, but further experiments must be made to determine the character of the two bodies definitely. The alkaloid is easily extracted by means of acidulated water.—Pharm. Rev., June, 1900, 266–268.

CELASTRINACEÆ.

Euonymus Artropurpureus—Dulcite a Constituent of the Bark.—The presence of dulcite in the cambial layer of *Euonymus Europæus* has long been determined and recognized by the investigations of Kubel and by v. Gillmer; but, based on the investigation of H. Paschkis, it has been generally assumed that the bark of *Euonymus artropurpureus* contains in place of dulcite its isomer mannite. Dr. M. Hoehnel now records the results of experiments, made in connection with the preparation of euonymin, which place it beyond a doubt that the substance regarded by Paschkis to be mannite is in fact dulcite, and that the bark of *Euonymus artropurpureus* contains dulcite in considerable quantities.—Pharm. Ztg., March 17, 1900, 210.

Maytenus Vitis Idæi — A New Drug from Argentinia. — Attention is directed in "Merck's Annual Report" (1899) to a new drug from Argentinia, where it has been used successfully in the treatment of certain diseases of the ears, eyes and gums. It consists of the leaves of *Maytenus Vitis Idæi*, and it is known under various native names; Palta, colquiyuyu, capia gangona, chaplan, sombra de toro carape, &c.—Pharm. Ztg., March 10, 1900, 190.

EUPHORBIACEÆ.

Euphorbia Lathyris, L., and Euphorbia Helioscopia, L.—Description.— Among the excellent articles in the annual report of the Missouri Botanical Garden is a monograph on "Revision of the American Species of Euphorbia of the Section Tithymalus," by J. B. I. Norton, from which, in view of the inaccessibility of this work to pharmacists, R. H. Dennisten has selected two species used in medicine, and has described them, with a reproduction of the original illustrations, in "Pharm. Review" (April, 1900, 159–162). These are: *E. lathyris*, L., a plant known under the common names of wild caper, caper bush, myrtle or caper spurge, mole tree, mole plant, and spring wort, the seeds of which—formerly used under the name of "semen cataputiæ minoris"—yield an expressed oil which is purgative and deposits a crystalline mass on standing, and contains also æsculin as a constituent, and *E. helioscopia*, L., which is known by a number of common names, as sun spurge, wartweed, turnsole, little good, cat's milk, churnstaff, wartgrass and mouse milk. The juice is said to remove warty growths.

Landolphia Perieri — A New Rubber-Yielding Plant. — H. Jumelle calls attention to a new species of *Landolphia*, a native of the forests of Madagascar, which he has named *L. perieri*, and which yields a caoutchouc of excellent quality, introduced under the name of

Piralahy or Vahælahy Rubber.—The latex is collected by cutting the climbing stems and allowing the sap to drain into suitable vessels, in which it is coagulated with lemon juice or crushed tamarinds. The sp. gr. of the latex is 0.9996, which is lower than that of most rubber-producing plants, while the density of the dry caoutchouc is 0.910, that of Para rubber being 0.920. The latex contains but little solid matter besides the caoutchouc, neither starch nor sugar being present. During the dry season but little sap is obtained, but this coagulates spontaneously, whereas during the rainy season the much clearer sap yields only about 6 per cent. of its weight of caoutchouc.—Pharm. Journ., Sept. 23, 1899, 295; from Compt. rend., *129*, 349.

Landolphia Caoutchouc—Method of Collection and Preparation.—R. Schlechter describes the collection of Landolphia caoutchouc in the Congo region. The climbing stem of the *Landolphia*, selected when of suitable size, is stretched out lengthwise near the ground, supported by

forked sticks about 1 M. in height. It is then tapped at intervals of from 12 to 18 inches by making incisions extending about half way around the stem, suspending small vessels under each incision, in which the latex is allowed to collect. After 24 hours the contents of the smaller vessels are removed into larger, in which the latex is conveyed to the camp. Here it is coagulated by boiling it either by itself, or usually with the addition of the acid juice of a species of *Costus* — the so-called "Bossanga-juice." The coagulum is thoroughly kneaded, and formed into sausage-like pieces, which are the next day cut into pieces, resembling in their form and size the quartering of a medium-sized apple. These are then dried on hurdles during the next following two months, before packing them for export in bags of bark. The superiority of Congo-caoutchouc is ascribed by the author to this thorough drying process. Whether the acid of the bossanga-juice has any influence on the quality of the product, remains to be determined by further experiments. — Apoth. Ztg., April 18, 1900, 262; from Tropenpfl., 1900, 28.

In a recent paper the author records the results of experiments made to determine the best method of treating the latex. He finds that simple boiling of the latex with water is, on the whole, the most satisfactory. The boiling is best done in earthen vessels, such as may be obtained from the natives, since the coagulum is more liable to stick to the sides of metallic vessels. The coagulum, when completed, is then kneaded thoroughly under water, and then further treated as described in the foregoing. During the drying process direct sunlight should be avoided. The product obtained with the addition of the acid bossanga-juice, or other acids — such as acetic, for instance—does not appear to differ from that prepared by boiling with water alone. The advantage appears to be that in the acid medium the coagulation is hastened. Separation of the caoutchouc by simple centrifugation was found impracticable, considerable of it remaining in the liquid portion. The caoutchouc may, however, be coagulated by simply allowing it to stand, after the manner of preparing curd from milk. After ten days the liquid, freed from caoutchouc, may be withdrawn, and the coagulum obtained treated in the manner above explained. The method of coagulation by smoke upon a wooden paddle, as practiced in Para, was also tried. This is extremely slow, and apparently possesses no advantage. — Apoth. Ztg., April 21, 1900, 269; from Tropenpfl., 1900, 109.

Natural Rubber Substitute—New Sources.—David Hooper calls attention to three elastic gums, all peculiar to India, which have recently been recommended as rubber substitutes. The first of these is obtained from the stem of the Banian,

Ficus bengalensis. This rubber had a dirty white appearance, a touch consistence, a sourish odor, and sank in water. It was found to dissolve in ether, chloroform, or carbon disulphide, without previous swelling, a

property which distinguishes it from the rubbers of *Ficus elastica* and *Hevea brasiliensis*. Another character was the perceptible loss when boiled with alcohol. A proximate examination gave the following results: Water, 4.06; resins, 65.24; caoutchouc, 19.82; aqueous extract, 3.64; ash, 2.06; dross, &c., undetermined, 5.18 per cent. The second substitute is obtained from two common wild plants,

Calotropis gigantea and *C. procera*. The latex of these plants has been the subject of examination by various writers since 1852, when Dr. Riddel, of the Nizam's army, pointed out that it had long been known to yield a form of gutta-percha. From an examination of the plants, known in the vernacular as "Madar," by Dr. C. J. H. Warden, in 1885, the following are the proportions which the various resinous principles of the juice bear to each other: Madar-alban, 12.66; madar-fluavil, 48.86; black acid resin, 19.72; caoutchouc, 16.92; yellow bitter resin, 1.81. The author has examined a sample of the latter freshly obtained from plants growing in Bengal, with the following results: It had a milky-white color, a strong nauseous odor, and a sp. gr. of 1.0416 at 15° C. It was miscible with water, but coagulated on boiling, and yielded 18 per cent. of solid matter after boiling and washing the juice. From the dried substance, boiling 90 per cent. alcohol extracted 62 per cent. of resins, leaving 25.54 per cent. of insoluble, soft gum, light brown in color and slightly elastic in the cold. The third substitute is the coagulum of the milky juice of

Excacaria Agallocha, Lin., a tree inhabiting the tidal forests of India. The latex, which is very acrid, has the reputation of being poisonous, hence the name "Blinding tree" which is sometimes applied to the plant. It is a milk-white liquid, having an acid reaction and the odor of sour milk; mixes freely with water, but coagulates below the boiling point, and is precipitated when spirit is added. It has the sp. gr. at 15° C. of 1.0718, and the following composition: Water, 61.94; resin (fluavil), 28.85; soluble in water, 1.76; albumin, soluble, 3.40; albumin, insoluble, 4.05 per cent. The resin was soluble in alcohol, ether, chloroform and carbon disulphide, was clear, amber colored, softened at 45° C., and liquefied at 55° C. It was unaffected by caustic soda solution and the diluted mineral acids. When burned it gave off the odor of caoutchouc, and produced a smoky flame. These characters are those of fluavil, but in this case it is not accompanied by any substance related to caoutchouc or the white crystalline alban.—Trans. Brit. Pharm. Conf., 1899, 465–470.

Caoutchouc and Gutta Percha.—Cultivation in German-Africa.—Sadebeck enumerates the following plants which, having been found most suitable for the industrial manufacture of caoutchouc, are cultivated in the German East-African colonies: (1) *Hevea brasiliensis*, Müll. Arg. (Euphorbiaceæ), which yields the best sort of caoutchouc — the so called "Para"— in its South American home, but makes so many demands con-

cerning locality and climate, that its cultivation is not encouraging. (2) *Manihot Glaziovii*, Müll. Arg. (Euphorbiaceæ), yielding the "Ceara" caoutchouc, also does not do as well as in its native country, South America, not adapting itself to the prevailing moist tropical climate, though it may possibly do well in dry localities, such as the East African plains. (3) *Ficus elastica*, Roxb. (Moraceæ), also introduced from South America, belongs to the most important and productive caoutchouc plants cultivated in South Africa, being readily propagated by cuttings and yielding after 6 to 8 years, as experienced in Sumatra and Borneo, when the stem has attained a circumference of 1 to 1.5 M., and the crown one of 45 to 50 M., as much as 2 kilos of caoutchouc at a single tapping. The most important plants, however, are the native *Landolphias* (Apocynaceæ)—*L. comorensis* var. *florida*, *L. Heudelotii*, and *L. Kirkii*. The latex of these plants, which was formerly coagulated by the addition of the juice of the large globular berries of the plant, is now coagulated by means of lemon juice, although spontaneous evaporation, or evaporation by boiling, also yields good caoutchouc.

Gutta Percha is obtained exclusively from plants belonging to the Sapotaceæ. The author recommends for cultivation the following: *Palanquium Gutta* (Hook), Burck (= *Isonandra Gutta*, Hook), *Dichospis Gutta*, Benth. et. Hook (from Malacca), *Palanquium borneense*, *Palanquium oblongifolium* (from Sumatra), and *Payena Leerii* (from the Malayan Peninsula). The latex of these plants coagulates spontaneously shortly after its collection, forming a somewhat porous spongy mass.—Pharm. Centralh., Aug. 3, 1899, 471.

Caoutchouc—Improved Method of Preparation.—Axel Preyer has conducted a series of investigations in order to improve the crude methods employed in the preparation of caoutchouc. A good crude product should contain a large percentage of caoutchouc, should be strongly elastic, neither sticky nor brittle, but firm and tough. Furthermore, it should be homogeneous, contain as little water as possible, and should not contain putrescible substances, such as albumen. If the crude product contains much substance soluble in alcohol (resins) it is usually sticky at first, afterwards becomes brittle, and is of little or no value. The problems to be solved therefore are to exclude these causes of inferiority with due consideration to economy. Experimenting upon a small scale, the author has succeeded in preparing a pure white caoutchouc, which remains permanently white after boiling with water and drying, by adding the fresh latex, or the concentrated latex obtained by centrifugation in a thin stream to a boiling aqueous solution of chloral hydrate or of formic acid, and boiling the mixture during several minutes. Formic acid being cheaper than chloral hydrate, it is the preferable of the two, the more particularly since it can be recovered easily. It remains to determine in how far the process is applicable on an industrial scale.—Apoth. Ztg., Dec. 16, 1899, 760; from "Tropenpflanzer," 1899, 327.

Arrow Poisons of the Wagogo—Source and Components.—According to Schellman the arrow poison of the wagogo is derived from the juice of the bark of two trees belonging to the Euphorbiaceæ. Brieger has isolated from this poison a crystalline body which corresponds chemically and physiologically with the wokamba arrow poison. It has the same action as amorphous ouabaïn, and a similar one to the amorphous strophanthin, obtained by Thoms from *Strophanthus hispidus*, but it fails to give a glucosidal reaction.—Chem. Ztg. Rep., *24*, 41.

Wakambo Arrow Poison—A Powerful Heart Poison Resembling Digitalis.—According to the investigations of Von Brieger, the arrow poison of the wakamba contains a heart poison of extraordinary toxity and closely resembling that of digitalis. He finds 0.05 Mgm. of the pure crystalline principle isolated by him to be fatal to guinea-pigs of 300 Gm. weight in fifty minutes, while 0.3 Mgm. to each kilo. of body weight was fatal to dogs. Analysis points to the formula $C_{29}H_{46}O_{19}$. The active principle crystallizes in anhydrous needles, melting at 182–184° C., but crystals containing 20 per cent. of water separate in larger plates, which melt at 93°–95° C. It is insoluble in ether, acetic ether, chloroform, and benzene; soluble with difficulty in cold, more soluble in hot, alcohol or water. The solution is lævogyre. The pure substance does not reduce Fehling's Solution. By long heating with mineral acids, a yellow, amorphous, non-poisonous body separates, which is easily soluble in alcohol. The aqueous solution, after the removal of this body, reduces Fehling's Solution, and gives an amorphous glucazone. The glucoside dissolves in concentrated sulphuric acid with a reddish-brown color, and green fluorescence. With tannic acid and the usual alkaloidal reagents the substance gives no precipitate.—Pharm. Journ., Jan. 6, 1900, 1: from Chem. Ztg. Repert, *23*, 315.

Castor Oil — Production in India. — R. F. Patterson, Consul-General, Calcutta, communicates some interesting information concerning the cultivation of the castor oil plant and the preparation of the oil from the seeds. The oil is usually extracted from these in two ways—by decoction and by expression. The process of decoction consists of bruising the seeds previously deprived of the husks, and then boiling them in water; the oil rising to the surface is skimmed off and afterwards again boiled with a small quantity of water to dissipate the acrid principles. To increase the product the seeds are sometimes roasted, but this makes the oil brownish and acrid. By expression, the seeds, after being thoroughly cleansed from the dust and fragments of the capsules with which they are mixed, are conveyed into a shallow iron reservoir, where they are submitted to a gentle heat. The seeds are then subjected to long-continued pressure by handscrews. The oil is transferred to iron boilers, containing a considerable quantity of water, and boiled for some time, the impurities being skimmed off as they rise to the surface. The clear oil is then carefully removed and the process is completed by boiling it with a small

quantity of water. There are two chief forms of the plant in India, of which there are many varieties. One form is a tall bush, a perennial, that yields a large seed and an abundance of inferior oil. The second is an annual plant, sometimes grown as a pure crop, though more frequently in rows of a field containing other crops. It yields a small seed, the better qualities of which produce the superior oil of commerce and of pharmacy. The oil obtained from the first plant is largely used for illuminating purposes, but it also finds a place as lubricating oil and for many of the industries of Europe, where the more expensive article would be prohibitive in price. Concerning the harvesting of the seeds, the Consul says that the picking begins in the seventh month and ends in the ninth. The seed-pods are gathered by hand, stacked, covered with straw and weighed. After six days the capsules become soft and rotten. They are then exposed to the sun for two days, and when thus dried are beaten with a heavy mallet about two feet long and one and a half feet broad, which removes about half of the seed. The remaining capsules are again dried and the beating process is repeated, which results in the husking of the balance of the seed. The whole is then cleaned and is ready for the next process — that of extracting the oil. — Pharm. Era., Oct. 12. 1899, 497; from Consular Report.

Croton Oil—Distinctive Characters.—As the result of exhaustive examination of specimens of croton oil, W. Duliére gives the following characters as distinctive of the pure official article: Sp. gr. at 15° C., 0.9437; at 100° C., 0.8874. Co-efficient for correction for each 1° C., 0.000657; solubility in 92 per cent. alcohol, 1 : 63; Burstyn's acid number, 21.7; total acid number, 215.6; consistence of soap, soft; solidifying point of fatty acids, 16.4° to 16.7° C.; Reichert-Meissl number, 12.1; iodine absorption number, 100.37 to 101.91 in 2 hours, 103.63 to 104.30 in 12 hours; iodine absorption number of fatty acids 101.23 to 104.39 in 2 hours; acetylation number, 38.64. Oil extracted with good petroleum ether, and cold pressed oil, agree in these particulars with oil extracted according to the Codex with ether. Oil obtained by hot pressing, or by ether from non-decorticated seeds differs in color, in acidity, and in solubility in alcohol, but agrees in its chief chemical characters—Pharm. Jour., Sept. 2, 1899, 219; from Jour de Phar. d' Anvers, *55*, 254.

URTICACEÆ.

Hops—Chemical Examination of the Strobules and of the Extract.—According to Ernst Hantke the analysis of hops and of extracts of hops comprises the following determinations: The water, the substance soluble in petroleum ether, the wax, the substance soluble in ethyl ether, the tannin, and the ash. The estimations of *water* and of the *ash* are carried out in the usual manner, except that in the case of the extracts these must be previously mixed intimately with a known weight of calcined sand

when making the water determination (at 100°–102° C). The petroleum extract is obtained by the aid of Soxhlet extractor with petroleum ether boiling at a temperature lower than 50° (sp. gr. 0.6616 to 0.6620), the hops being first dried at 50° C. for two days and then in an exsiccator for two days longer, while the extracts must be mixed with calcined sand. On treating the petroleum extract with alcohol of 90 per cent, this dissolves the *soft* resin, which may be determined by evaporating the alcoholic solution, while the portion insoluble in alcohol is calculated as wax. The *hard resin* is extracted with anhydrous ethyl ether (sp. gr. 0.7283) from the marc remaining after extraction with petroleum ether. The *tannin* is estimated by boiling 6 Gm. of the original material with 400 Cc. of water for 5 hours, in a flask fitted with a reverse condenser; then bringing the liquid to the volume of 500 Cc., and filtering. 100 Cc. of the filtrate are subjected to the action of a hide filter and evaporated, and another 100 Cc. are evaporated to dryness directly—the difference between the two weights giving the amount of tannin present in the sample.—Chem. News, March 9, 1900, 109; from Chem. Ztg., 1899, 545.

Cannabis Indica—Reputed Difference in Potency of the Compressed and the Loose Drugs.—Dr. E. M. Holmes observes that attention is again directed to the fact that a stronger variety of *Cannabis indica* than that official in the B. P. is imported for export to the West Indies. Some years ago, Dr. Geo. Watt pointed out that a great difference in potency existed between the round bundled drug ("ganjah" in the vernacular) and the flat, the former being the product carefully cultivated in Bengal, while the latter is cultivated in the Central Provinces, and is known as Bombay "ganjah," and also in the London market, as "guaza." The latter is both cheaper and inferior, but happens to be the official (B. P.) variety, since the term "compressed" can only apply to the flat ganjah. Since the stronger Bengal ganjah, however, may at any time appear in quantity in the market, its use for the official B. P. preparations might be attended with more or less risk. Dr. Holmes suggests, therefore, the propriety of making Bengal ganjah the official variety of the drug, so that it may be regularly used in place of the inferior Bombay drug.—Pharm. Journ., May 19, 1900, 522.

Indian Hemp—Physiological Effects.—Dr. W. E. Dixon has examined the physiological activity of various samples of crude Indian hemp and of some of its derivatives, and concludes that hemp exerts its effects differently according to the preparation used, fresh hemp, for example, being diuretic, whilst the dried possesses little such action. Its effects vary according to the manner in which it is taken into the system; when smoked exhilaration is most manifest, whilst when taken by the mouth in small quantities exhilaration is generally not observed. It is recommended that where an immediate effect is desired the drug should be smoked, the fumes being drawn through water. In fits of depression, mental fatigue, nervous

headache and exhaustion a few inhalations are said to produce an almost immediate effect, causing sense of depression, headache and feeling of fatigue to disappear, and the subject being enabled to continue his work, feeling refreshed and soothed. Other results claimed are to give staying power and alter the feelings of muscular fatigue which follow hard physical labor. Absorption does not occur for one or two hours when the drug is taken by the mouth, but the effects are more lasting than when it is inhaled. Hemp taken as an inhalation is placed in the same category as coffee, tea and kola, being free from danger and without alarming effects. In fact, Dr. Dixon has come to regard it, in this form, as a useful and refreshing stimulant and food accessory, and one whose use does not lead to a habit which grows upon its votary. If taken by the mouth hemp must be classified with the narcotics, and when given in that way the nervous effects produced may be such as to cause serious alarm, though no danger is to be apprehended whilst the heart remains regular and strong. Frequent observation, both subjective and objective, lead the author to affirm in conclusion that hemp is soothing and stimulating, being a specially valuable cerebral stimulant when inhaled. He believes it to be an exceedingly useful therapeutic agent, one not likely to lead to abuse, and producing in proper dosage no untoward after-effects.—Pharm. Journ., Dec. 2, 1899, 521; from Brit. Med. Journ., Nov. 11, 1899, p. 1354.

Mulberry Leaves—Diuretic Action.—According to "Bull. Gen. de Therap.," an infusion of 2.5 Gm. of mulberry leaves in two cupfuls of boiling water is a popular diuretic in Siberia. The leaves are infused for eight or ten hours, and a cupful of the infusion, which is not unpleasant to take, is drunk night and morning for three days.—Pharm. Journ, March 17, 1900, 287.

CONIFERÆ.

Pinus Strobus, L.—*Chemical Characters of the Oil.*—Edw. Kremers calls attention to a paper on the volatile oil of *Pinus strobus*, L., by W. A. Trayser, an abstract of which was published in the Proceedings of the Wisconsin Pharm. Assoc. in 1891 (p. 41), but seems to have escaped the attention of Drs. Gildermeister and Hoffmann, who have recently published an important monograph on volatile oils. The white pine, *Pinus strobus*, L., occurs from Newfoundland and the northern shore of the Gulf of St. Lawrence to the northern shore of Lake St. John and the headwaters of the Moose river, and westward to Lake Michigan and the valley of the Winnipeg river, ranges southward through Pennsylvania, Virginia, Kentucky, Tennessee and the Carolinas to Georgia. The tree is also known as the Weymouth pine, northern pine, and spruce pine; but the term "white pine" is not restricted to *P. strobus*, lumbermen applying this term to other species. From fresh leaves of the white pine collected near New London, Wisc., and identified botanically as belonging to *Pinus*

strobus, L., Mr. Trayser obtained a small quantity (10 Gm.) of oil by steam distillation, amounting to 0.09 per cent. On fractionation this yielded about 30 per cent. boiling between 155°–170° C., 15 per cent. between 179°–190°, 8 per cent. between 190° and 265°, and 42 per cent. between 265° and 285°. From the first (155°-170°) fraction he succeeded in preparing pinene nitroso-chloride. The last fraction (265°–285°) was slightly yellow and viscid, remained liquid in a freezing mixture, and was possibly a sesquiterpene. The leaves were found to contain about 2 per cent. of resin.—Pharm. Review, Nov., 1899, 506–508.

Cedar (*Cedrus atlanticus? Rep.*)—*Therapeutic Value.*—Trabert calls attention to the medicinal use of cedar resin and wood in early times, but that modernly it is used rarely, although the resin is still valued highly by the inhabitants of the Atlas mountains in affections of the respiratory organs. Some years ago (1898) Manquat prepared from cedar wood derived from trees growing in the Atlas mountains (*Cedrus atlanticus?* Rep.) a quantity of the volatile oil, obtaining about 300 Gm. from 10 kg. of the wood. Since then the author has carefully distilled some of the oil from Tenier-el-Haad, in the Atlas, the yield being about 5 per cent. of a pleasantly odorous, colored oil, bearing great resemblance to sandal-wood oil. This oil has been subjected to therapeutic experiment by Prof. Gémy, who finds it to be of decided value in the treatment of gonorrhœa, and even preferable to sandal oil, since it does not produce pain in the lumbar region, such as is often occasioned when sandal oil is given. To distinguish this product from other cedar oils, he proposes to designate it as

Atlas-Cedar Oil, which he recommends as an efficient substitute for sandal oil, both on account of its qualities and cheaper price. He expresses the hope also that the oil may be subjected to comprehensive chemical investigation in the near future.—Apoth. Ztg., June 20, 1900, 413: from Bull. Soc. Pharmacol.

B. Animal Drugs.

Silk-Worm Gut—Method of Manufacture on the Island of Procida.—Consul Neville Rolfe communicates the following interesting account of the manufacture of fine gut from silk worms on the Neapolitan island of Procida. They call the product "fili di seta," or "silk threads," their special properties consisting in their strength and flexibility. They are made from the stomachs of silk-worms, just before they begin to spin their silk and form their cocoons. The following is the process of manufacture: The worm is selected when fully matured, that is to say, at the moment when his nourishment ceases, and just before his metamorphosis. He is then cut open, great care being taken not to injure the membrane of the stomach. This is then removed, and usually reaches the length of 13 or 20 millims., with a diameter of 1½ to 2 millims. The stomachs are then

put into a pickle, which is the keynote of the whole process and the secret of which is carefully kept. When the pickling process is over, the workpeople, who are mostly women, take one end of the stomach in their teeth, and draw the other end with their hands. This part of the work requires great dexterity, for the threads are drawn out to the length of thirty to fifty centimeters, the whole value of the product depending upon its length in relation to its thickness, and the strain it will carry. There are two seasons for the production, namely, in the spring, when the best gut is produced, and in autumn when the quality is inferior.—Pharm. Journ., Sept. 16, 1899, 293; from Brit. Consular Report.

Cochineal—Ash Determinations in Commercial Samples.—Rodney H. True reports on the examination of commercial samples of cochineal by Ed. Koske. The general appearance of most of the samples led to the inference that this article is subject to gross adulteration. The adulterant is evidently of mineral origin, the substance being in form of a coating. Ash determinations were made in eight samples, with results as follows: 30.2, 23.8, 20.1, 19.1, 7.2, 34.0, 35.0, and 12.0 per cent. respectively. Barium salt was found in one sample, iron in two others, but the main adulterant was not determined in any case. Water determination of five samples showed the presence of from 4.5 to 6.7 per cent.—Pharm. Review, Aug. 1890, 346–348.

Honey—Influence of Artificial Feeding.—Dr. Haenle, of Strassburg, records the results of some interesting experiments made to determine the influence of different foods upon the production of honey by bees. On feeding the bees with a 33.7 per cent. solution of cane sugar, of which one-third was flavored with oil of rose and one-third with oil of anise, while the remainder was inverted by means of tartaric acid (2 : 900), the honey found in the hives was invariably of a brown color, sweet taste, and devoid of aroma. In each of the three cases the rotatory power of the honey was —3°, notwithstanding that the inverted solution had a rotatory power of —13°. The natural products, obtained from bees deriving their food from the blossoms in meadows, on trees, and in gardens, had uniformly a yellow color, a waxy (honey-comb), sweet taste, and the aroma of the flowers upon which they gathered the honey. The polarizing power was —37° and —35°, and these honeys, like the preceding, found to be free from dextrin. In the instance of scarcity of natural food and partial artificial food gathered from an adjacent preserve factory, the polarization was reduced to —12° to —15°; traces of dextrin were noted, the honey was brown, and the taste waxy and sweet. Artificial honey, derived from a honey factory near Hamburg, and composed of heather-honey and invert sugar, was more or less brown, showed a polarization of —41° to —50°, and had a somewhat bitter taste and aroma of the heather. Both of the last qualities—bitterness and aroma—were completely lost after a year's keeping.—Pharm. Centralh., Oct. 26, 1899, 656; from Pharm. Ztg., 1899, 742.

Bees-Wax—An Italian Imitation.—Prof. Angelo Funaro calls attention to an imitation of bees-wax produced by an admixture of seven substances, among which bees-wax need not enter as an ingredient even in small portions. According to Vice-Consul Carmichael some of this wax has recently been shipped to England from Leghorn as "Tuscan wax," and he points out that it is very easy for a dealer to be deceived by the appearance of this artificial wax.—Pharm. Journ., May 19, 1900, Suppl. *d.*

Bees-Wax—Sample Having a Rosin-like Taste.—H. V. Arny had occasion to subject a sample of bees-wax to examination, which was submitted to him on acconnt of its peculiar "rosin-like" taste, though otherwise of apparently normal quality. Its sp. gr., melting point, and all other data obtainable by the pharmacopœial tests, seemed to affirm the purity of the wax, while further examination showed its acid and ester numbers to be within the limits of a pure product, an estimation of the iodine number being prevented by the illness of the author. On boiling the wax with water for half an hour and extracting the filtrate with ether, a trace of sticky residue, having an intensely bitter taste, was obtained. This suspicious product was evidently an accidental impurity transmitted to the wax by the bee.—Amer. Jour. Pharm., Feb., 1900, 74.

Yellow Wax—Adulteration.—Charles H. La Wall and Robert C. Pursel, who have exceptional opportunities to examine into the commercial qualities of yellow wax, report the results of examination of samples from twelve lots. Seven of these are supposedly pure. The other five were adulterated. They contained paraffin and stearic acid in three cases, stearic acid alone in one, and tallow and carnauba wax in another. It appears to be comparatively easy to so adjust the adulterants that neither the specific gravity nor the melting point will give any indication of adulteration. The low acid number reveals paraffin and stearic acid in some cases, and the same may be said of the ether number, whilst the higher numbers are indicative of stearic acid alone, or of tallow and carnauba wax.—Amer. Jour. Pharm., Aug. 1899, 396; Proc. Penna. Pharm. Assoc., 1899, 157.

Japan Wax—Pharmaceutical Advantage.—Robert Pürsel points out some of the advantages of Japan wax over beeswax for the preparation of plasters, salves, etc. Adulterations of Japan wax are unknown, whereas beeswax is frequently adulterated. It is easily soluble in ether, while beeswax is soluble only to the extent of 50 per cent. Rose-water ointment made with Japan wax has a whiter color, the rose-water is more readily mixed with it, and does not separate as easily as from the ointment made with beeswax.—Pharm. Centralh., Nov. 9, 1899, 689; from Bull. de Pharm. du Sud-Est, 1899, 281.

Pisang Wax—Characters and Composition.—M. Greshoff communicates the results of a chemical investigation of the wax of a variety of Pisang growing in Java, which is called by the native "pisang

karet." It is collected from the under side of the extremely large leaves of the plant by scraping with wooden knives, or by the heat of a fire and collection in a pan or cocoanut shell, and afterwards melted and strained through a sieve. The specimens examined by the author were in form of very hard cakes, either white, cream-yellow or light green in color, more or less translucent, breaking with a coarse granular-crystalline fracture, and readily reduced to powder by trituration. The surface was covered with various impurities, and on melting considerable impurities, such as fragments of leaves, stems, fibres and insects, were separated. The wax melts at 79° to 81° C., has generally the sp. gr. 0.965 at 15° C., and yields barely 0.1 per cent. of ash. Boiling alcohol dissolves about 1 per cent. of the wax, and the portion so dissolved separates for the greater part again in a gelatinous condition on cooling, this portion also having a lower melting point (about 68°) than the portion insoluble in boiling alcohol. A similar separation takes place from its solution in boiling chloroform, acetone, ether and petroleum ether. While readily soluble in boiling oil of turpentine, carbon disulphide and amyl alcohol, these also retain but a small percentage of the wax in solution, the following percentages being retained by the various solvents at 15° C.; Alcohol, 0.2; acetone, 0.5; oil of turpentine, 1.0; chloroform, 1.7; carbon disulphide, 1.8 per cent. The acid number of the wax is 2–3; the saponification number 109. In its composition pisang wax resembles the other vegetable waxes.—Apoth. Ztg., Nov. 25, 1899, 712; from Pharm. Weekbl. 1899, No. 27.

Cod-Liver Oil—Preparation and Adulteration in Norway. — B. Rauitz has had opportunity to witness and study the methods employed in Norway for preparing cod liver oil. Two methods are practiced, the one depending on the action of steam for depriving the liver of oil, this variety being designated as "Steam-medicinal Cod Liver Oil;" the other is a cold process, the product being known simply as "Cod Liver Oil" (Leberthran). It is only the latter kind that finds its way into the German markets, since the steam oil does not correspond with the requirements of the German Pharmacopœia, and finds a market mainly in Scotland and France. The author witnessed the process known as the *cold process* in Tufjord on Rolfsö, which he describes as follows: The leaves, separated from the gall-bladder, are placed, fresh from the animal, into a wooden tube, 1½ M. in height by 2–2½ M. in diameter, until the tub is nearly full, which is then left exposed to the action of the sun, shining day and night in these high latitudes. After about three weeks the extraction is completed, and, owing to the favorable atmospheric conditions — the evident absence of germs in this far polar region — not the slightest evidence of decomposition manifests itself during this process. The oil runs off pure and simply has the odor characteristic of cod liver oil; and while the "steam cod liver oil" requires refining, that obtained by the "cold process" described is ready for the market as run off from the tubs. This explains why in

more southerly latitudes it is impossible to prepare a satisfactory cod liver oil; the cold process is not available, while the steam process does not yield a desirable oil. In this connection the author calls attention, however, to the fact that much "liver oil" is prepared by the cold process in the same high latitude from a species of shark, *Scymnus vulgaris* (Læmargus borealis); that this oil is not distinguishable in physical appearance and character from true cod-liver oil, and that it is evidently used largely for adulterating the product supplied to the German trade. — Pharm. Ztg., April 4, 1900, 261; from D. Med. Wochenschr., 1900, No. 13.

Kangaroo Tendons—Use in Surgery. — Wm. B. Marshall directs attention to specimens of kangaroo tendons recently received by the Philadelphia Commercial Museum. The tendons are derived from the tail of the animal, are preserved in a preservative liquid, are described as aseptic and chromicized, and are said to be superior to silk for sewing up wounds, being strong, and splitting up lengthwise without fraying. The specimens received are in four thicknesses.—Amer. Journ. Pharm., Jan., 1999, 40.

INORGANIC CHEMISTRY.

General Subjects.

Chemical Drugs—Estimation of Purity by Incineration.—Prof. A. Doumergue communicates the results of an extensive series of experiments which point out the value of incineration at a red heat as a means of estimating the purity of chemical drugs. In accordance with these results and observations they are divided into three classes: 1. Drugs completely volatilized; 2. Non volatile drugs; and 3. Drugs partially volatilized. To the first class belong all organic chemicals and a few inorganic, such as salts of mercury, of ammonia, etc. In these, complete volatilization at a red heat may generally be accepted as evidence of purity, though not invariably, but a residue is absolutely indicative of impurity. To the second class belong the bromides, chlorides and iodides of potassium and sodium, the carbonates of lithium, potassium and sodium (dry), the oxides of magnesium, copper, iron, lead and zinc, calcium phosphate, potassium hyperoxide, sulphate and sulphide, and sodium sulphide. All of these may lose at a red heat not more than 1 or 2 per cent. of their weight, such loss being due to hygroscopic absorption of water. The third class comprises a very large list of chemical substances which suffer more or less decomposition at a red heat, either by destruction of their acid radicle (acetates, benzoates, chlorates, citrates, nitrates, tartrates), or by dissociation (carbonic acid, water, etc.). This list, in alphabetical arrangement, gives the

percentage of residue and mentions the product into which the original product is converted by the incineration, for which see Pharm. Post, Sept. 10, 1899, 488–489; from Jour. de Pharm.

Volumetric Indicators—Unsatisfactory Commercial Quality.—F. H. Knight has made an examination of some commercial indicators used in volumetric analysis to ascertain their general efficiency. He finds a wide variation in certain common indicators as found in the market, this being particularly true of *methyl orange*, the most valuable of the indicators used. *Cochineal* was found to give particularly good results in artificial light, and is readily obtained of proper quality; but for general all-around purposes, *litmus* was found to be the best adapted, its effciency, of course, depending on a careful preparation of its solution.—Proc. Mass. State Pharm. Assoc., 1899, 59.

Colloidal Metals—Insolubility.—K. Stoekl and L. Vanino prove by their experiments that the so-called solutions of colloidal metals are not true solutions, but simply hold the metals in suspension in an extremely finely-divided state, in which they offer enormous resistance to their eventual deposition. The color of these pseudo-solutions leads to the conclusion that these metals are in different states of aggregation, those containing the larger particle depositing more rapidly than those containing the smaller.—Apoth. Ztg., Dec. 2, 1899; from Ztschr. physik Chem., 1899, *30*, 98.

NEW ELEMENTS.

A New Radio-Active Material—Isolation from Pitch Blende.—A. Debierne, starting with that portion of the acid solution of pitch blende which is not precipitated by hydrogen sulphide, and is completely precipitated by ammonia or ammonium sulphide, has isolated a fraction from this material, the radio-activity of which has been roughly determined as being five thousand times greater than that of uranium. He, furthermore, finds that the new substance possesses properties entirely different from those of radium and polonium (see Proceedings, 1899, 586) and that the rays emitted by it are quite comparable with those which have been observed by M. and Mme. Curie from the two bodies named. The new substance is not, like radium, spontaneously luminous.—Chem. News, Nov. 3, 1899, 209; from Compt. rend., *129* (Oct. 16, 1899), No. 16.

In a second paper, the author gives the results of further experiments made with the new radio-active substance, which confirms him in the view that it is a new elementary body, for which he proposes the name of

Actinium.—The substance, as previously shown by him, is precipitated by the principal reagents for titanium, but he now proves that titanium does not resemble it in all its reactions. He has, however, not succeeded in obtaining it in a pure or isolated condition. The most active substance obtained consists chiefly of thorium, and from this the actual new radio-

active substance remains to be extracted. — Chem. News, April 12, 1900, 169; from Compt. rend., *130* (April 2, 1900), No. 14.

Peruanum—A New Element (?).—Dr. A. Lindner has separated a substance from lead, sulphur, arsenic and antimony ores from the Peruvian Andes, which he is inclined to consider a new element, and has named it "peruanum."—Pharm. Centralh., Aug. 10, 1899, 488.

Krypton — Determination of Density. — After much work with liquid air, and many researches of low temperatures and the separation of bodies by this means, Professors A. Ladenburg and C. Kruegel consider themselves in a position to solve a few questions which have been raised by the splendid researches and discoveries of Ramsay and his co-workers. It seemed to them possible to obtain krypton, of which little was known at the time the authors began their labors in this direction, in a state of greater purity, and to settle somewhat more accurately its properties, and particularly to prove if its atomic weight really amounts to 80–82, as Ramsay assumes. Beginning their work over a year ago, they succeeded in obtaining, by methods explained in detail, a small quantity of krypton from a large quantity of liquid air, manufactured in the factory Rhenania, near Aachen, by means of Linde's air-liquefying machine, capable of furnishing 50 liters of liquid air per hour. They have every reason to assume that the krypton finally obtained was absolutely free from both oxygen and nitrogen, and that in fact it was pure. Their experiments with this pure substance point out that the density of krypton is 58.8, referring to O = 32. Then, as to the question of the position which krypton occupies in the periodic scale, the authors, assuming the density of 58.8 to be nearly correct, suggest a new group of the elements in air before group I., so that He = 4 before lithium,, Ne = 20 before sodium, A = 39 before potassium, and finally, Kr = 59 before copper. This, however, can only be considered a hypothesis, which requires further testing, and in this the authors are now engaged.—Chem. News, May 4, 1900, 205–207.

OXYGEN.

Ozone—Production During the Decomposition of Water by Means of Fluorine.—Henri Moissan has recently again made some experiments, originally made in 1891 and now repeated, having larger quantities of material at his command, which afford a new proof of the easy polymerization of oxygen to form ozone at a low temperature. A current of fluorine, prepared in a copper apparatus, is led into water through a small platinum tube—the water being kept at 0° C. Attached to the vessel is a bulb, into which the liberated gas passes. When the bulb is full by displacement of the ozonized oxygen, the contents are estimated by means of a solution of potassium iodide in presence of excess of sulphuric acid. The iodine liberated by the ozone is titrated with sodium thiosulphate solution. As much as 143.9 Cc. of ozone was found per liter.—Chem.

News, Nov. 10, 1899, 230; from Compt. rend., *129* (Oct. 6, 1899), No. 16.

Peroxides—Characteristic and Convenient Test.—Frank R. Dudderidge observes that a characteristic and easily applied reaction for the detection of a peroxide of an alkali or alkaline earth, consists in the addition of silver nitrate solution to a small portion of the powder in a test-tube. In the case of an alkali metal brisk effervescence occurs at once, due to evolution of oxygen—easily recognized by a glowing match-stick—and a *black* precipitate of metallic silver is at once deposited. With the alkali-earth metals the reaction takes place more slowly, a *brown* precipitate of silver oxide being first produced, soon followed by evolution of oxygen, the precipitate turning to black metallic silver. The reaction in this latter instance is hastened by the application of heat. The effect produced is no doubt due to formation of silver oxide in each instance, and its decomposition by the peroxide, similar to its well-known reaction with hydrogen peroxide.—Pharm. Journ., Feb. 17, 1900, 153.

Barium Peroxides—Formation by the Action of Hydrogen Peroxide on Barium Oxide.—De Forcrand has studied the action of hydrogen peroxide on barium oxide and found that two successive combinations of barium peroxide are formed: one very rich in hydrogen peroxide, which has never been isolated; the other corresponding in its composition to the formula $BaO.2H_2O_2$, and doubtless the well-defined compound isolated by Schoene and Berthelot. The author, in a second paper, gives the results of his studies concerning the

Hydrates of Barium Peroxide, of which several are known, the most important being; $BaO_2.H_2O$, $BaO_2.10H_2O$, BaO_3H_2O and $BaO_2H_2O_2$. He prepared these by adding to solutions of baryta dilute hydrogen peroxide in varying proportions, measuring the heat evolved. When a large excess of hydrogen is used, compounds are formed which are further oxidized than the trioxide, but they are more and more unstable, and are, besides, very highly hydrated.—Chem. News, April 6 and 12, 1900, 168 and 179; from Compt. rend., *130* (March 12 and April 2, 1900).

Hydrated Calcium Peroxides are produced by the author like the barium compounds, by acting on calcium oxide with hydrogen peroxide, but the calcium compounds are more soluble than the hydrated strontium peroxides and less soluble than the corresponding hydrated barium peroxides. Between 10° and 16° C. baryta and strontia give precipitates containing 8 to 9 molecules of water, whilst the calcium precipitate contains only 2 molecules of water, and has a very different heat of formation. The transformation of calcium dioxide into the hydrated state depends solely on the temperature, the critical temperature being somewhere between 15–20° C. The precipitate of hydrated calcium peroxide, $CaO_2 \cdot 8H_2O$, if kept cool, can be dried in a vacuum by means of phosphoric anhydride. After six

days a dry amorphous powder was produced, which was very nearly anhydrous CaO_2. A

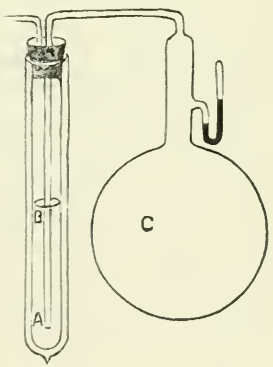
Lithium Peroxide was obtained by the author in small quantities (traces) only by burning lithium in an atmosphere of oxygen. But by allowing hydrogen peroxide to act on a solution of lithia, lithium peroxide is readily obtained, this also containing water of hydration. In one case the composition corresponded to the formula $Li_2O_2.H_2O_2 + 3.07H_2O$, in the other it was $Li_2O_2.H_2O_2 + 2.77H_2O$.—Chem. News, June 15, 22 and 29, 1900; from Compt. rend., *130* (1900), Nos. 20, 21 and 22.

HYDROGEN.

Hydrogen—Solidification.—The announcement is made in "Chemical News," Aug. 18, 1899, that Professor Dewar has succeeded in solidifying hydrogen into a glassy transparent mass.

Hydrogen—Method of Solidification.—After numerous attempts to obtain hydrogen in a solid state, Prof. Dewar, having become convinced that his failures in the early experiments must have been due to supercooling of the liquid, succeeded by a method which he describes as follows: A flask, *C* (Fig. 72), of about a liter capacity, to which a long glass tube bent twice at right angles was sealed, as shown in the cut, and to which a small mercury manometer can be sealed, was filled with pure dry hydrogen and sealed off. The lower portion of this tube, *A B*, was calibrated, and surrounded with liquid hydrogen placed in a vacuum vessel arranged for exhaustion. As soon as the pressure got well reduced below that of the atmosphere, perfectly clear liquid hydrogen began to collect in the tube *A B*, and could be observed accumulating until, at about 30 to 40 Mm. pressure, the liquid hydrogen surrounding the outside of the tube passed suddenly into a white foam-like mass, almost filling the whole space, while the hydrogen in the interior of the tube *A B* was seen to be a transparent ice in the lower part, but looked frothy on the surface. This fact prevented the solid density from being determined, but the maximum fluid density has been approximately ascertained to be 0.086, the liquid hydrogen at its boiling point having the density of 0.07. The solid hydrogen melts when the pressure of the saturated vapor reaches about 55 Mm., from which the author deduces a melting point of 16° or 17° absolute. The foam-like appearance of the solidified hydrogen when produced in an ordinary vacuum is due to the small density of the liquid and the fact that rapid ebullition is substantially taking place in the whole mass of liquid. An important

FIG. 72.



result of the successful solidification of hydrogen is that the last doubt as to its having a metallic character has been removed. For the future hydrogen must be classed among the non-metallic elements.—Chem. News, Sept. 15, 1899, 132–133.

Liquid Hydrogen—Effect of its Temperature on Seed Germination.—At the instance of Prof. Dewar, Sir W.T. Thiselton Dyer has made some experiments on the influence of the temperature of liquid hydrogen on the germinative power of seeds, selecting the seeds carefully according to their fitness and for comparison with similar experiments previously made by Brown and Escombe with liquid air. The seeds so selected were wheat and barley, vegetable manna, mustard and peas, the number being necessarily small on account of the limited supply of liquid hydrogen. They were sealed up in a glass tube cooled first in liquid air and then transferred to hydrogen. In this way a temperature of —250° or —252° C., was reached, and maintained for half an hour, and later for an hour, another set of seeds being cooled only in liquid air for comparison. On opening the tinfoil packages in which the seeds had been wrapped they were found to be as fresh and bright as before treatment. They were sown in a cool greenhouse, without heat, on July 27. On August 1st they had all germinated. Again a packet of seeds was cooled, this time without graduation of cooling, and actually immersed in liquid hydrogen for upwards of six hours. The temperature reached was —453° F. below melting ice. These seeds germinated without exception. Professor Dewar considers that there is no doubt about the seeds having actually been brought down to the temperature of the liquid hydrogen. It seems probable that the plant structures are deficient in thermal transparency, and they are notoriously indifferent conductors. Nevertheless, it is difficult that in the case of such small bodies as seeds, their being brought to the temperature with which they are surrounded can be more than a question of time. It is not impossible, however, that even at low temperatures the thermal capacity of at least the seed-coats may be considerable.—Pharm. Journ., Dec. 9, 1899, 549; from Proc. Roy. Soc., *420*, 361.

Hydrogen—Safe Method of Igniting.—A simple method to insure safety from explosion when igniting hydrogen is suggested by C. G. Hopkins. As soon as the action begins in the hydrogen apparatus, collect the escaping gas in a test-tube, and when the latter is thought to be full of pure gas —in less than a minute—remove the test-tube two or three feet from the generator and ignite the hydrogen. If the gas explodes in the test-tube it will leave no flame; if it does not explode, the flame remains in the test tube, with which the gas issuing from the generator may then with safety be ignited.—Journ. Amer. Chem. Soc., *21*, 634.

Water—Superiority of Erythrosine as Alkali-Indicator.—According to J. W. Ellen's experiment, lacmoid, phenacetolin and erythrosine are in

general equally serviceable indicators for alkali determinations in water by Hehner's method, but erythrosine gives more uniform results and higher percentages of carbonates, and is on the whole preferable to either of the others if the results are to agree within narrow limits, or when turbid or colored water is to be examined. The limit of error, with painstaking care, does not exceed + 1.5 per cent. with either of the three indicators, however. Upon

Erythrosine, the alkalies, alkaline earths, the salts of cadmium, manganese, nickel and cobalt, react alkaline; the salts of the oxides of iron, aluminum and chromium react like acids. It cannot be used for organic acids, but is available for ammonia.—Pharm. Centralh., July 3, 1899, 413.

Water—Comparison of Rapid Methods for Purification.—F. Malmeyac has experimented on four processes recommended for the rapid purification of water, two using alum and two ferric chloride. He finds them all simple and rapid. The experiments show that the ferric chloride methods (Almend' Upsal's and Manget's) give the best results, as they diminish the proportions of organic matter, either in an acid or an alkaline medium, by 60 per cent., while the alum processes (of Babé and of Werner) only reduce it by 25 and 33 per cent. respectively. The two latter, however, are nearly three times as powerful in their action on microbes.—Chem. News, Jan. 26, 1900, 46: from Journ. de Pharm. (6) x., No. 8.

Water—Estimation of Salts of the Alkaline Earths.—The determination of the carbonates producing the "hardness" of water by one of the customary "soap methods" is more or less inaccurate and troublesome. G. Marpman suggests a direct method for the estimation of the total hardness of water, due to the presence of lime and magnesium salts, as follows: A liter of water is boiled with sodium carbonate in excess until the alkaline earth salts are completely converted into carbonate; the precipitated calcium and magnesium carbonates are repeatedly washed by decantation with distilled water, so as to remove the soda as completely as possible, the presence of which would lead to error in the final result. The collected precipitate is then at once distilled with 10 Gm. of ammonium chloride, in presence of some water, and from 100 to 150 Cc. of distillate obtained, which contains the ammonia liberated from the chloride as carbonate from the reaction with the carbonates of the alkaline earths. This distillation is preferably conducted in flasks of Jena-glass, since ordinary glass yields a portion of its alkali by prolonged boiling. The ammonium carbonate is then determined by titration with $\frac{N}{2}$ sulphuric acid, 2 mol. of ammonia corresponding to 1 mol. of calcium oxide. The reactions involved are smooth and take place with ease and regularity throughout the process.—Pharm. Centralh., Sept. 14, 1899, 559.

Potable Water—Sterilization with Chlorinated Lime.—Some years ago Traube proposed a method for sterilizing drinking water by means of

chlorinated lime, which, though satisfactory in other respects, had the disadvantage of not clarifying rapidly and completely. Prof. A. Lode has since experimented on an extensive scale, and recommends the following method as being satisfactory for sterilizing water in large quantities: Dry chlorinated lime is triturated with an equal weight of water so as to form a smooth paste, using 0.15 Gm. of the dry substance for each liter of water to be sterilized, to which it is added while thoroughly stirring, followed immediately by the addition of 0.073 Gm. of hydrochloric acid (= 0.294 Cc. of acid. hydrochlor., Ph. Germ.) per liter. In the course of half an hour the water will be found completely clarified, when 0.3 Gm. of sodium sulphite is added per liter of water. This may then at once be used. The formation of a granular sediment may sometimes result; but the supernatant water will be invariably perfectly clear, and may easily be decanted for consumption, since the sediment is specifically quite heavy.—Apoth. Ztg., Sept. 27, 1899, 578; from Hyg. Rundsch., 1899, 859.

Drinking Water—Algæ a Cause of Contamination.—G. T. Moore contributes a lengthy review concerning the presence of *Algæ* in drinking water, with particular reference to the disturbances to which they give rise in water supplies and their contaminating effects upon the water used as a beverage. The group of plants which is, perhaps, the best known as polluting drinking water is the one containing the forms popularly called the "blue-green algæ." Whether, in a technical sense, they really are algæ, is perhaps a question, as they are much simpler in structure than the true algæ, and show a great resemblance to the bacteria, both vegetatively and in their methods of reproduction. This is so evident, that the "blue-green" forms have been put with the bacteria into a separate group known as the Schizophyta, and termed *Schizophyceæ*, while the name *Schizomycetes* has been applied to the bacteria. The author enumerates the various forms of the *Schizophyceæ* which have been found in contaminated drinking water in which they occur, in the form of a key which brings out the morphological points depended upon for their determination. A short bibliography is appended to this very interesting paper, which must be consulted in the original in Amer. Journ. Pharm., Jan. 1900, 25–36.

Artificial Ice—Peculiarities of Composition.—A. Christomonas observes that two zones may generally be recognized in artificial ice, an inner, turbid layer, surrounded by an outer one of clear ice. If these two layers are carefully separated and analyzed, it will be found that the clear ice is composed of nearly pure water, from which with exception of insignificant traces, all the salts originally contained in the water have separated, and that these salts will be found almost quantitatively in the inner, turbid portion of the ice, together with nearly all the micro-organisms that may have been present. In an experiment made with a sample of water, containing 71 germs to the cubic centimeter, the clear ice was found to con-

tain only 8 to 10 germs, whereas the turbid ice contained about 450 germs in the cubic centimeter. Clear ice obtained from fairly pure water may therefore be regarded as sufficiently pure for internal consumption, whereas such use of turbid ice should be absolutely avoided.—Apoth. Ztg., Jan. 20, 1900, 48; from Oesterr. Chem. Ztg., 1899, 486.

Distilled Water—Preparation of a C. P. Product.—Marck recommends the observance of certain conditions to secure a distilled water in a practically chemically pure state. Employing the ordinary copper, well-tinned, still and condenser, the connection should be fitted accurately so that no luting whatever shall be used. The cleaning of the still and its parts should be by simple rinsing with clean water, so that the introduction of fatty and other substances is completely avoided. Having rinsed the still with a little ordinary distilled water, the requisite charge of ordinary distilled water is introduced and heat is applied, the cooling of the condensing worm being omitted until steam has escaped during about five minutes, when the condensing water may be turned on. A small quantity of potassium permanganate having been added to the water in the still after it begins to boil regularly, the distillate is now collected, the first portion by itself, as usual, and the greater part of the remainder collected as C. P., observing that the temperature be moderate, so that the distillation may not be too rapid. In this way, using 30 liters of water and 3 Mgm. of permanganate, the first distillate amounted to about 3 liters, and the main distillate to 18 liters. The first distillate usually contains the carbonic acid and traces of ammonia, and may be used for rinsing and similar purposes. The main distillate is practically chemically pure, and should be preserved in large glass-stoppered flasks of hard white Bohemian glass, which should be previously well cleansed with water containing 1 per cent. of nitric acid, and finally with distilled water. By the use of permanganate, and by allowing the steam to pass through the cooler for a short period before beginning its condensation, organic substances in the water and micro-organisms attached to the interior of the cooler are completely removed or destroyed.—Pharm. Ztg., Jan. 31, 1900, 87.

Distilled Water — Removal of Unpleasant Odor and Taste. — It is well known that even with the exercise of the greatest care, distilled water will frequently retain both odor and taste. This is attributable to gaseous decompositon products resulting from over-heating of substances originally present in the water when these are deposited in the course of the distillation on the walls of the distillatory vessel which are exposed to direct heat. Gustav Christ has now devised a contrivance which interposed between the still and condenser, permits the escape of the malodorous and bad-tasting gaseous decomposition products, and thus permits the preparation of distilled water absolutely free from these objectionable qualities. The apparatus has been used with great satisfaction by a prominent mineral water manufacturer of Berlin (Schulz, Exerzier Str. 4 a.), who will

gladly give information concerning the practical advantage of the apparatus.—Apoth. Ztg., March 24, 1900, 203.

Distilled Water—Precaution in Examinations Conducted Over Gas Flames.—O. Wentzky having during one examination of distilled water noted the presence of an acid in the vapor arising during its evaporation, and in the course of another found a contamination with copper, traced both of these to the gas flame from the Bunsen burner employed. In the second, the copper was derived from the metal composing the Bunsen burner. When the evaporation was conducted with the aid of a spirit lamp, neither sulphuric acid was found in the one, nor copper in the other case.—Pharm. Ztg., Sept. 16, 1899, 654.

Hydrogen Dioxide—Preparation.—According to A. Lambotte hydrogen dioxide is obtained in a pure and relatively uniform condition by the following method: 400 Gm. of phosphoric acid (50 per cent.) are mixed with 1000 Gm. of water, and the mixture is placed into a vessel containing ice and salt, a few small pieces of ice being placed in the liquid itself. A magma obtained by triturating 750 Gm. of finely powdered barium dioxide and 1000 Gm. of water together is then added in small quantities at a time with constant stirring, carefully avoiding any appreciable rise in the temperature. The solution of hydrogen dioxide is then clarified by subsidence, decantation, and filtration. It should be at most only faintly acid in reaction; otherwise some more barium dioxide or baryta water must be added until the excessive acidity is overcome. In this way a solution of hydrogen dioxide is obtained containing from 15–17 volume per cent., which requires no further purification, and needs only adjustment to the desired strength—the titre being best determined by the well-known permanganate method.—Pharm. Ztg., Aug. 2, 1899, 540; from Jour. de Pharm. d' Anvers, 1899, 250.

Hydrogen Dioxide—Inefficiency of Preservation.—A writer in "Amer. Drugg." (Aug. 10, 1899, 67) communicates the results of experiments made with the object of determining the efficiency of different substances that have been recommended as preservatives of hydrogen dioxide—such as boroglyceride, alcohol, nitrous ether, acetic acid, etc. His results show that these preservatives are not only inefficient, but that they are themselves oxidized, and to that extent are worse than no preservative at all.

Hydrogen Peroxide—Rate of Decomposition in Presence of Various Protective Agents.—Chas. T. Tyrer records experiments made with the view to determine the rate of decomposition of solutions of hydrogen peroxide and the value of different protective agents. A 10 vol. solution containing 5 per cent. of free sulphuric acid was stored in different containers—such as ordinary quarts, champagne, soda water bottles, and half gallon stone jars, screw stoppered. Under the most favorable conditions the content in hydrogen peroxide was reduced during the first six months to 7.9 vols., and

in ten months to 5.3 vols., while the least favorable showed 6.5 and 3.5 vols. for the respective periods. With a 12 volume solution preserved with 1 per cent. of the following preservatives, the results after six months were as appended; in glycerin, 8.8; sulphuric acid, 8.1: hydrochloric acid, 7.6; boroglyceride, 8.8; alcohol, 8.6; phosphoric acid (sp. gr., 1.500), 9.2 vols. The author concludes that the best method of keeping solutions of hydrogen peroxide in a laboratory is to store in a receiver, having a trap at the base, and protecting the solution by a layer of petroleum carefully poured on the surface. For transportation, champagne or soda water bottles are probably the best. Of the protective agents, phosphoric acid appears to be the best and medicinally least harmful.—Trans. Brit. Pharm. Conf., 1899, 410–414.

Hydrogen Tetroxide—Supposed Formation.—In a communication to the German Chemical Society (Berichte, 1900, *33*, 1506), A. Bach contends that the liquid obtained on mixing a solution of hydrogen peroxide with sulphuric acid probably contains hydrogen tetroxide, H_2O_4. Prof. Armstrong now points out that Bach has obviously failed to take into account the existence of persulphuric acid in such a solution. In the experiments of Bach—both in those in which palladium hydrogen was oxidized and in those with peroxide—a large excess of normal sulphuric acid was added; the solution was then titrated with permanganate, and the oxygen which was given off was collected and measured. It is noteworthy, also, that the liquid was shaken during several minutes after the titration was completed in order to expel the gas. It is therefore an open question whether, in these cases, some persulphuric acid was not formed by peroxidation of the sulphuric acid, and whether the extra oxygen obtained by Bach was not derived from this.—Pharm. Journ., June 23, 1900, 663; Proc. Chem. Soc., *16*, 134.

NITROGEN.

Nitrogen—Atomic Weight.—G. Dean deduces from the results of previous workers a mean value of 14.034 for the atomic weight of nitrogen, but points out that the means of the determinations by chemical methods of individual workers vary from 13.975 (Pelouze) to 14 05 (Stas). The ratio of the densities of oxygen and nitrogen, as determined by Lord Rayleigh and M. Leduc, is 16 : 14003. As those variations seemed to be too great, he decided to try a new method which would involve as few atomic weights as possible, and only those which are known with the highest accuracy. Silver cyanide was selected as the compound containing nitrogen, and the ratio between a given mass of it and that of the potassium bromide required for the complete precipitation of the silver contained in it, determined with all the precautions insisted on in such work by Stas. The cyanide was decomposed in some cases by dissolving it in nitric acid, in other experiments sulphuric acid. The ratio between the purest silver and

the sample of potassium bromide used was carefully determined, so that the ratio found was really Ag : AgCN. This was found to be 107.93 : 133.962, whence CN = 26 032 and N = 14.031 if C = 12.001.—Pharm. Journ. Dec. 9, 1899, 549 ; from Proc. Chem. Soc., *15*, 213.

Nitrogen—Use of Sodium Hypophosphite in Kjeldahl's Process of Estimation.—When mercury is employed to aid the oxidation of nitrogenous matter in Kjeldahl's process, sodium sulphide is generally used to remove the metal. Maguenne and Roux find that sodium hypophosphite is preferable for this purpose, since it effectually reduces the mercury salts, and obviates the formation of insoluble sulphur compounds, which are difficult to decompose with alkali, or of volatile sulphur compounds which may distil over with ammonia, vitiating the results. They employ a gramme of hypophosphite, which is added to the sulphuric acid solution after dilution. The mixture is warmed to 60°–70° C., to complete the reduction, and cooled before the addition of alkali. The results obtained are a trifle higher than those from experiments conducted with sulphide, and accord better with those obtained with the soda-lime method.—Pharm. Journ., July 22, 1899, 82 ; from Bull. Soc. Chim. de Paris, 21, 312.

Nitrogen Chloride—Irritant Action of the Fumes.—W. Hentschel observes that accidents due to the inspiration of the fumes of chloride of nitrogen, which hardly appears to be an irritant, have not up to the present been recorded. The author, however, after having been working with solutions of NCl_3 for about six months, was suddenly attacked with inflammation and acute irritation of the mucous membrane, pains in the bronchial tubes, loss of voice, and fever ; recovery was very slow.—Chem. News, April 27, 1900, 203 ; from Berichte, xxxii., p. 1878.

Nitrogen — Compounds with Oxygen. — During the process of purifying argon from nitrogen, Berthelot measured the proportion between nitrogen and oxygen as the mixture is subjected to the electric discharge. The results are interesting, as showing the successive and gradual formation of the different oxides of nitrogen. It appears that gaseous nitrous acid is always formed first, even in the presence of an excess of oxygen, and that it only changes into peroxide of nitrogen very slowly. The dioxide of nitrogen formed under the action of the electric spark on the mixture of nitrogen and oxygen combines, first with one atom of oxygen, forming nitrous anhydride, $2NO + O = N_2O_3$: then it unites with a second atom of oxygen, forming peroxide of nitrogen, $N_2O_3 + O = 2NO_2$.— Chem. News, Aug. 18, 1899, 83 ; from Compt. rend., *129* (July 17, 1899), No. 3.

Pure Alkaline Nitrites—Preparation.—E. Divers recommends the following method and process for preparing pure alkaline nitrites : Nitric acid is caused to react with starch, or arsenous acid, the temperature and the strength of the acid being regulated so that in the products obtained

nitric acid predominates over the peroxide. The gas is passed into an empty flask, in which unchanged nitrous acid is deposited, and then into a concentrated solution of pure alkaline hydrate or carbonate. Both potassium and sodium nitrite so obtained are slightly yellow, very soluble in water, and yield solutions which are alkaline to litmus. When free from nitrates their solutions may be evaporated to dryness without decomposition. Both salts when crystallized are anhydrous, but soon deliquesce. Sodium nitrite melts at 271° C.—Chem. News, Jan. 12, 1900, 19; from Journ. Coll. Sci., Tokio, Japan.

Sodium Nitrite—Manufacture.—Details of the manufacture of sodium nitrite, which is now very largely used in the dyeing industry, being very scarce in chemical literature, M. A. Darbon gives a description of the process, which may be briefly outlined as follows: Purified (? Rep.) Chili saltpetre is melted in large cast-iron vessels, whereby hygroscopic water is removed and a part of the iodides and iodates, still present, are decomposed. At 310° C. the saltpetre begins to fuse. It is heated to 400°–420° C., and pure metallic lead in thin sheets is gradually added, the mass being constantly stirred, about 280 parts of lead being necessary for 100 parts of saltpetre employed. The lead must be as pure as possible, because of the presence of other metals, above all of antimony. When all the lead has been added, care having been exercised to prevent overheating, the stirring must be kept up for some time, and the melted mass is then, by means of a cast-iron ladle, run in the form of thin threads into water with constant stirring. In this process, besides the nitrite about 1 per cent. of caustic soda is produced, which in its turn dissolves a portion of lead, and has to be removed during the subsequent purification, either by nitric acid or by nitrate of lead or sulphuric acid. The crude products are a solution containing the nitrite, undecomposed saltpetre, caustic soda holding lead in solution, and the soluble impurities of the saltpetre, such as sodium chloride, etc.; and a residue consisting of lead oxide, a little metallic lead, and a certain proportion of lead peroxide. The solution strained from the residue, with the washings, is diluted to about 6°–8° B., neutralized with nitric acid as long as a precipitate is formed, separated from precipitate formed, concentrated to 42°–45° B. while warm, and then left to crystallize—the crystals requiring possibly recrystallization. The pure crystals are separated by a centrifugal machine, washed, dried and packed in cylinders of double thickness of parchment paper.

In this connection the author takes occasion to correct an error which has slipped into most treaties on chemistry, that sodium nitrite has an alkaline reaction. This is not the case — the *pure nitrite* is absolutely neutral.—Chem News, Sept. 22, 1899, 145; from Chem. Ztg., 1899, 173.

Nitric Acid—Determination in Water by Means of Cresol.—By reversing the reaction proposed by A. Schneider for the determination of cresol

by means of nitric acid, Russwurm finds in cresol an admirable reagent for nitrates in water, which is capable of detecting 1 part of nitric acid in 100,000 parts of water. To obtain the reagent a red-colored cresol, which distilled over colorless at 187° C., and was apparently chiefly composed of ortho-cresol, was employed, 20 Gm. of the distillate being mixed with 280 Gm. of conc. sulphuric acid and allowed to cool. Of this reagent, 5 Cc. are mixed with 2 Cc. of the water to be examined, and the mixture is diluted with 5 Cc. of distilled water after standing 5 minutes. It is then allowed to cool, ammonia is added in excess (35 Cc.), and finally enough distilled water to 50 or 100 Cc. A distinct yellow color is developed, deeper or lighter according to the amount of nitric acid present, the quantity being determined colorimetrically by comparison with liquids of known strength, the yellow color remaining unchanged for days. The reagent is quite as sensitive as diphenylamine, over which it possesses a number of advantages. Nitrous acid, as is the case with diphenylamine, produces the same reaction as does nitric acid.—Pharm. Centralh., Aug. 24, 1899, 517.

Nitric Acid—Source of Possible Error by the Dimethylamine Reaction.—In order to confirm the absence of nitric acid in hydrant water, in which indigo failed to give a reaction, L. Legler evaporated a quantity of the water to a small volume, decanted the concentrated water *clear* from the yellowish sediment, and applied the well known diphenylamine test. An instantaneous blue color resulted, but this was by further experiments found to be due to the presence of ferric oxide in minutely divided condition, and not to nitric acid.—Pharm. Centralh., Sept. 7, 1899, 545.

Fuming Nitric Acid—Convenient Preparation by the Aid of Formaldehyde.—L. Vanino recommends a method of quickly preparing fuming nitric acid which may prove useful for preparing it in the pharmaceutical laboratory. Commercial formaldehyde is added to concentrated nitric acid: this assumes a yellow color, and nitrogen dioxide is formed copiously under violent reaction accompanied by a crackling noise. If then heat is applied in order to rapidly terminate the reaction, generation of hyponitrous acid results at once, and being conducted into nitric acid, the fuming acid is formed.—Pharm. Post, Nov. 5, 1899, 608; from Ber. d. d. Chem. Ges.

HALOIDS.

Chlorinated Lime—Explosion in a Close Vessel.—"E. S." reports an experience which should serve as a caution when opening a close vessel containing chlorinated lime of good quality. He had occasion to open the stoppered shop-container of the article in question, which had not been opened for four months. Ordinary efforts being unavailing to remove the stopper, he resorted to tapping the latter with a weight, whereupon the stopper was violently blown up to the ceiling and quantities of the dusty chlorinated lime blown into his face and eyes. The chlorinated lime ap-

peared to be exceptionally dry and had been kept in a locality where it was completely protected from light.—Pharm. Ztg., July 12, 1899, 489.

Referring to the foregoing, Dr. E. Mylius observes that such explosions were formerly frequently observed, when the chlorination of lime was more thorough than is the practice now. These explosions are caused by the elimination of oxygen, which is continuously given off, particularly under the influence of light, and more abundantly in the degree of its chlorination. The weakening of chlorinated lime is due to this constant decomposition and consequent evolution of oxygen. If then the container is perfectly air-tight, the liberated gas accumulates in it, and thus gives rise to the explosions that have been observed—the tension of the enclosed vapor sometimes becoming so great as to cause the explosion of its container without any external agency.—*Ibid.*, July 15, 1900, 497.

Potassium Chlorate — Explosive Properties — Berthelot finds that, although potassium chlorate is not generally considered to be a detonating explosive, when suddenly introduced into surroundings previously heated to a temperature above that at which decomposition commences, it will detonate under ordinary pressure in an open vessel, even when enveloped in an inert gas. In that respect it resembles picric acid. This may be shown experimentally in the following manner: A glass tube 25 to 35 Mm. in diameter closed at one end, and fixed almost vertically, is heated in a gas flame to a red heat for about 25 to 30 Mm. of its length; in the meanwhile, a glass rod, drawn out to a thread, is dipped several times into a melted mass of $KClO_3$, each coat of the melted salt being allowed to cool before a fresh immersion is made. In this way a bead of the salt is formed at the end of the thread. This is then plunged into the red-hot tube to about 10 Mm. from the bottom, taking care not to touch the sides. As the chlorate liquefies under the influence of heat radiating from the sides of the tube, it slowly drips on the bottom, and as each drop falls, a sharp detonation, accompanied by white fumes, will be obtained. The detonation, however, does not affect the melted salt, which remains adherent to the glass thread. The chlorate detonates more markedly when heated directly in a hydrocarbon flame. The conditions cited above may easily be reproduced in the case of a great fire, where the walls of a warehouse may become heated as described. — Pharm. Journ., Jan. 20, 1900, 41; from Compt. rend, *129*, 926.

Potassium Chlorate—Solubility in Water.—By the aid of an exceedingly simple apparatus of his own design, Br. Pawlewski has ascertained the solubility of potassium chlorate in water, at intervals of five degrees from 0° C. to 100° C. Its solubility at 15° C. is 1 in 18.5, and at 100° 1 in 1.8. These differ somewhat from the solubility stated in the U. S. P.—Pharm. Review, July, 1899; 313; from Ber. d. Chem. Ges., *32* (1899), 1040.

Bromine.—A constituent of the thyroid glands of sheep, which see under "Organic Chemistry."

Iodine—A Constant Constituent of Fresh Water Algæ, as well as of Marine Species.—According to the investigations of A. Gautier, iodine appears to be a constant and essential constituent of the protoplasm of fresh water algæ, as well as in marine species. He has detected it in notable quantities in all the species examined, varying at most from 24 parts of iodine per million of dry substances in fresh water species to an average of 600 parts per million in marine algæ. Certain lichens and fungi also contain iodine. Bacteria appear to contain little or none, but the bacterial algæ of sulphurous springs contain on an average 360 parts of iodine per million, whilst microscopic algæ, especially the marine species, and those which grow as lichens, are exceptionally rich in that metalloid.—Pharm. Journ., Aug. 26, 1899, 199; from Compt. rend., *129*, 189.

Iodine—Absorption by Plants.—P. Bourcel finds as a result of a series of experiments on different plants that they vary greatly in their power of absorbing iodine from a soil containing a given quantity of that element, some species refusing it altogether. A difference is even exhibited in this respect between different species of the same genus; but some natural orders appear to possess the property in a greater degree than others. The Liliaceæ and the Chenopodiaceæ display this faculty to a much greater extent than the Solanaceæ and the Umbelliferæ.—Pharm. Jour., Jan. 13, 1900, 21; from Comptes rendus, *129*, 1899, p. 768.

Iodine—Distribution in Sea Water.—Experimenting with the water of the Mediterranean collected at different depths, A. Gautier finds that there is no great variation in the amount of iodine, but that the condition in which it is present varies greatly. These conditions are shown in the following table:

Sea Water.	Amount and Condition of Iodine in 1 Million Parts.			
	Insoluble Organic Iodine.	Insoluble Organic Iodine.	Inorganic Iodine.	Total Iodine.
On surface	0.286	1.960	None	2.246
At a depth of 880 meters	0.100	2.130	0.150	2.380
At 980 meters	0.065	1.890	0.305	2.260

The amount of mineral iodine is thus shown to be considerable at the lower depths and the insoluble organic iodine relatively small, while, as organized life becomes more plentiful towards the surface, the amount of insoluble organic iodine increases and the inorganic salts of iodine decrease in quantity, becoming absolutely *nil* on the surface.—Pharm. Journ., Sept. 23, 1899, 295; from Compt. rend., *129*, 9.

Iodine—Recovery from Waste Products.—F. D. Chattaway and K. J. P. Orton propose a method for the recovery of iodine from waste products which depends on the conversion, primarily, of the iodine, whether present as soluble iodides or in an oxidized form, into iodine monochloride. The material from which iodine is to be recovered is heated on a water-bath with aqua regia, containing a slight excess of hydrochloric acid, cautiously first, but finally nearly to boiling, no appreciable loss of iodine taking place. In the case of soluble iodides or iodates, the theoretical quantity only is required; insoluble iodides need slightly more, while, if organic matter is present, a variable and larger excess must be employed. If waste oxidizing agents are available, as, for example, the residue from the manufacture of chromic acid, they may be used in place of the nitric acid, modifications of the method easily suggesting themselves. The iodine can be obtained from the monochloride in a state of great purity in various ways. The whole may be divided into equal parts, and one decolorized by the cautious addition of sulphur dioxide or a sulphite, all the iodine at once separates on mixing this with the undecomposed moiety; or the solution of the monochloride may be much diluted with water and allowed to stand, when the element separates in splendid long crystals. Lastly, if very pure iodine be required, the monochloride may be poured into an excess of ammonia, whereby about 95 per cent. of the iodine is converted into nitrogen iodide. This, after washing, may be warmed with an excess of water to about 60° C. as recommended by Stas, when it quickly decomposes, yielding most of the iodine in an absolutely pure state.—Pharm. Era, Aug. 3, 1899, 164; from Journ. Soc. Chem. Ind.

Iodine—Determination in Iodides.—In place of the official (B. P.) process of determining the iodine in iodides, by titration with decinormal silver nitrate solution, etc., Frank R. Dudderidge recommends the process suggested by Cook in 1885, which consists in liberating the iodine by means of hydrogen peroxide in excess in the presence of acetic acid, shaking out the liberated iodine with successive quantities of chloroform, washing the chloroformic solution with water to remove any excess of peroxide, and then triturating with "hypo" in presence of starch paste. The author's experiments prove this method to be more accurate and more expeditious than the official method, and applicable not alone to sodium and potassium iodides, but equally well to the official syrup of ferrous iodide.—Pharm. Journ., Feb. 17, 1900, 152.

Iodides—Improvement of the B. P. Method of Assay.—Frank R. Dudderidge criticises the official (B. P.) method of determining the iodine in iodides, which depends upon titration with $\frac{N}{10}$ silver nitrate. He questions if the change of color is sharp enough in these cases for any but the experienced eye to determine the end reaction, and is inclined to prefer a method which depends on the liberation of the iodine and its subsequent

determination with thiosulphate, a more correct method. Cook, in 1885, suggested hydrogen peroxide in the presence of acetic acid to liberate the iodine, which is taken up by chloroform. The chloroform is washed with water to remove excess of hydrogen peroxide. To test how far the results obtained by this process compared with those obtained by the B. P. method, a solution was prepared containing exactly 1 gramme of potassium iodide in 100 Cc. Ten Cc. = 0.1 gramme KI were taken and treated as above, but without washing the chloroformic solution of iodine, the result indicating iodine equal to 0.0997 gramme KI, or 99.7 per cent. Another 10 Cc. was taken and the process repeated, this time washing the chloroform with water. As these washings evidently contained free iodine, they were shaken out with more chloroform, and this latter added to the washed chloroform, the result this time being slightly lower, iodine equivalent to 0.0988 gramme KI, or 98.8 per cent., being found. Another 10 Cc. titrated by the B. P. method gave 0.10003 gramme KI, or 100.03 per cent. The range permitted by the B. P. is from 98.01 to 101.96 per cent. These results show that Cook's process is reliable, easy to carry out, and more accurate than the B. P. method.—Chem. & Drugg., Feb. 17, 1900, 283.

Potassium Iodide—New Process of Titration.—E. Vincent recommends a new process for the titration of potassium iodide, which he describes as being simple, rapid and reliable. It is based on the same principles as that of Berthet, depending on the following reaction between iodic acid and iodine: $6HIO_3 + 5KI = 5KIO_3 + 3I_2 + 3H_2O$. The five-sixths of iodine set free comes from the iodide; it is estimated by titration with hyposulphite of soda. One Gm. of the iodide is dissolved in 1 liter of distilled water, and 2 Gm. of iodic acid are dissolved in another liter of water. By means of a pipette, take 100 Cc. of each of these solutions, and mix them together; measure 5 or 10 Cc. of hyposulphite solution containing 2.48 Gm. per cent. and containing 2 Gm. of potassium bicarbonate per liter; run the iodine solution, drop by drop, from a burette into the hyposulphite solution until a faint yellow color appears. — Chem. News, Feb. 9, 1900, 71; from Journ. de Pharm. (6) x., No. 11.

"Iodized" and "Iodides" of Sulphur — Distinction and Preparation. L. Prunier calls attention to the distinction between "iodized" and "iodides" of sulphur.

"*Iodized Sulphur*" is prepared by heating sulphur to about 115 to 120° C.—that is, just about melting point—and gradually adding to it an equal quantity of iodine. Stir till the iodine is dissolved and allowed to cool; the product crystallizes completely in a blackish-brown mass—which must be kept in well stoppered flasks, as the iodine is very volatile. When reduced to powder, iodized sulphur immediately gives up its iodine to a solution of hyposulphite. There are several

"*Iodides of Sulphur.*" The one experimented on was formed by first heating the sulphur to its second fusing-point; a thermometer is then plunged into the mass, which is allowed to cool down to about 200° C., when the pasty state is reached; the coarsely-powdered iodine is then gradually added (4 parts of iodine to 1 of sulphur). The combination takes place with considerable energy. When all the iodine is added, the mass is allowed to cool; it, however, always contains iodized sulphur in varying proportions. — Chem. News, Oct. 6, 1899, 172; from Journ. de Pharm. (6) ix., No. 9.

Iodic Acid—Estimation in Crude Sodium Nitrate.—R. Auzenat recommends a colorometric method for the estimation of iodic acid in crude sodium nitrate, samples of which frequently containing from 1 to 6 per cent. of sodium iodate. The method is dependent on the liberation of iodine from added potassium iodide by the iodic acid derived from the iodate, the latter being decomposed by acetic acid, which does not decompose the iodide. To carry out the test, six test tubes of equal length and diameter are placed into a rack over a sheet of white paper, a mark on each showing on the same level 50 Cc. In the first 10 Cc. of a solution of *potassium iodate* containing 1 Gm. per liter are placed; into the second, 30 Cc. of a solution of *raw nitrate* containing 35 Gm. per liter; in the third, 35 Cc.; in the fourth, 40 Cc.; in the fifth, 45 Cc.; and in the sixth, 50 Cc. of the same solution. To each of the first five tubes distilled water is added up to the mark, then to all six 2 Cc. of a solution of *potassium iodide* (1 : 10), and, as rapidly as possible, five drops of *glacial acetic acid.* A caramel color immediately appears after slight agitation in the first tube, and also in the others if iodate is present in the sample, the intensity varying with the amount present, and enabling comparison with the first tube taken as the standard. If all are darker than the standard—the amount of iodate solution for the standard is increased to 20 Cc., or even more; if they are all lighter, the standard must be prepared with less (say 5 Cc.) of the iodate solution. It is indispensable, however, to fill all the tubes fresh for each experiment, as the color changes with time, and comparison must necessarily be made under identical conditions. Under these, the estimation can be made with the same rapidity, and the same exactitude as the estimation of ammonia with Nessler's Solution.—Chem. News, Feb. 16, 1900, 76; from Monit. Scientif. (4), xiv, Feb. 1900.

Iodic and Hyperiodic Acid—Atomicity.—A. Rosenheim and O. Liebknecht, in view of the fact that iodic acid is capable of forming quite stable and well-characterized acid salts, as well as double compounds with other acids, concluded that this property is due to the poly-basity of the acid. Their investigations have confirmed this view, and they find that free

Iodic Acid is bibasic and has the composition $H_2I_2O_6$. The bi-iodates

are atomistic compounds of the formula $R.HIO_6$. If the bi-iodates are neutralized, a splitting of the union results with formation of neutral iodates, the latter being salts of hypothetical monobasic iodic acid, HIO_3. With regard to

Hyperiodic Acid, it was determined that this is a five-basic acid, H_5IO_6. The normal silver salt, Ag_5IO_6, is obtained in the form of a black precipitate by prolonged agitation of sodium periodate, $Na_2H_3IO_6$, suspended in cold water, with a large excess of silver nitrate solution. With strong bases hyperiodic acid forms stable monobasic salts, which are the normal salts of monobasic meta-hyperiodic acid. The polybasic salts are decomposed in aqueous solution.—Apoth. Ztg., Dec. 13, 1899, 750; from Liebig's Ann. Chem., 1899, *308*, 40.

Fluorine—Occurrence in Natural Mineral Waters.—Parmentier having in a recent paper on the corrosion observed on glass placed in contact with certain mineral waters thrown a doubt on the existence of fluorides in them, except in rare cases, Charles Lepierre calls attention to the fact that notable chemists in France, Germany, Portugal, &c., Nicklès, Gonvenain, Sainte Clair Deville, Willin, Fresenius, da Silva, Reis, and others, have frequently had occasion to note the presence of fluorides in mineral waters. While it is true that, as a rule, the fluorides exist only as traces, certain waters, though rare, are rich in fluorides. Such is the mineral water from Gerez in the north of Portugal, which according to analyses made by Sousa Reis contains in the liter only 0.296 Gm. of mineral residue (Lapierre puts it at 0.310 Gm.), but of this 0.022 to 0.025 Gm. is alkaline fluoride, probably of sodium, which corresponds to 10 or 12 Mgm. of combined fluorine in the liter. Such quantities cannot be overlooked, as they represent nearly one-tenth of the total residue. The waters of Gerez are much frequented, and have a truly remarkable effect in cases of liver maladies—from simple congestion to cirrhosis.—Chem. News, Dec. 22, 1899, 295; from Bull. Soc. Chim. (*3*) xxi., No. 18.

Referring to the same subject, A. J. Ferreira de Silva and Alberto d' Aguiar call attention to the rather frequent occurrences of fluorides in mineral waters. So, for instance, in many alkaline and sulphurous springs in Galicia, in the Spanish springs of Lugo and Guiliriz, and in Portugal, besides that of Gerez, in the waters of the spring at Campilho (Vidago). —*Ibid.*, Jan. 6, 1900, 4; from Bull. Soc. Chim. (3) xxi., Nos. 20 and 21.

Sulphur Perfluoride—A New Gaseous Compound.—H. Moissan and P. Lebeau state that when a small piece of sulphur, supported by a fine platinum wire, is suspended in an atmosphere of fluorine in a tube above mercury, it takes fire, burning with a livid flame, and the mercury rises in the tube. The resulting gas is partially absorbed by potash solution, but not by water, the remaining gas, after treatment with alkalies, being very stable. Two fluorides thus appear to be formed, the one unabsorbed by

water but absorbed by potash, the other unabsorbed by either water or potash, though capable of being destroyed by sodium vapor. The latter is the perfluoride, SF_6, which by varying the proportions of sulphur and fluorine has been found to the amount of 90 per cent. of the gas produced. Chem. News, April 27, 1900, 202; from Compt. rend., *130* (April 2, 1900) No. 14.

In a second paper on sulphur perfluoride, SF_6, the authors state that this gas is one of the heaviest known, its density being 5.03. Its examination is very interesting, owing to the inertness of its properties, and it is remarkable that two such active bodies as sulphur and fluorine, when united to saturation, should produce a compound which is not attacked by melted potash or by sodium at its fusion point. The composition of this substance proves the hexatomicity of sulphur in a simple manner. It is totally different from the known chlorides of sulphur.—Chem. News, May 11, 1900, 225; from Compt. rend., *130* (April 9, 1900), No. 15.

SULPHUR.

Ammonium Hyposulphite — Preparation for Titration.— In connection with their method for estimating *Tannin* (which see, under "Organic Chemistry") L. Specht and F. Lorenz direct the preparation of ammonium hyposulphite—in form of solution—as follows: 50 Gm. of zinc dust and 100 Gm. of water are mixed together, and 600 Cc. of solution of ammonium bisulphite of 20 B., neutralized with ammonia, is allowed to flow into this mixture, which must be refrigerated so that the temperature does not rise above 36°. The solution is clarified by subsidence, and 75 Cc. of it are diluted with previously boiled and cooled water to 2000 Cc. The flocculent precipitate produced on dilution is allowed to subside, since filtration and consequent access of air must be avoided. The titre of the hyposulphite solution is then adjusted to safranin, according to specific directions given. — Pharm. Ztg., April 7, 1900; from Chem. Ztg., 1900, No. 17.

Sulphuric Acid—Concentration in Iron Vessels.—E. Hartmann calls attention to the possible necessity of hereafter concentrating sulphuric acid in vessels made of some other metal than platinum, the great advance in the price of that metal making its use for this purpose almost prohibitory. For some time past the author has successfully used apparatus made of cast-iron, and now gives some details, of interest mainly to manufacturers, which apparently justify its use in all cases in which an acid is not to be produced that is absolutely free from iron. In practice it has been found that the iron dissolved is readily deposited in an acid at 66° B., traces of it only remaining in solution. Thus, a sample of acid at 66° B. contained 95.4 per cent. H_2SO_4 and only 0.015 per cent. of Fe_2O_3; another sample from the same source contained 97.1 per cent. of H_2SO_4 and 0.010 per cent. Fe_2O_3.—Chem. News, Dec. 22, 1899, 295; from Chem. Ztg., 1899.

Sulphates—Detection in Presence of Thiosulphates.—After reviewing the difficulties encountered in the detection of small quantities of sulphates in the presence of thiosulphates, Leonard Dobbin recommends the plan devised by Grossman for quantitatively determining sulphate in presence of sulphite and thiosulphate. The solution is placed in a suitably filled flask, the air is displaced by means of carbonic anhydride, and the liquid is heated. Excess of hydrochloric acid is added, and the liquid is boiled down to one-fourth its original volume, a current of carbonic anhydride being passed into the flask all the time. The whole of the sulphurous anhydride set free is carried off by the escaping carbonic anhydride as water and vapor. The liquid remaining in the flask is filtered from the separated sulphur, and the sulphate remains in the filtrate, where it can be detected, and, if desired, quantitatively determined.—Pharm. Journ., Feb. 24, 1900, 182.

PHOSPHORUS.

Phosphorus—Conversion into Arsenic (*?*).—T. Fittica, referring to a statement made by Flückiger in 1892 that the modification of phosphorus called "black phosphorus," obtained by the action of ammonia on ordinary phosphorus, is in reality arsenic, states that his own experience confirms this observation, although he has succeeded in obtaining only small but variable quantities of arsenic by this reaction. Further experiments, however, have shown that the synthesis of arsenic from phosphorus is quite possible if oxidizing agents containing nitric acid are used. For this purpose, 2 Gm. of amorphous phosphorus, free from arsenic, are carefully mixed with 12.9 Gm. of finely powdered ammonium nitrate, and the mixture is introduced into a tube, attached to a condenser, and heated in a sand bath very gradually until a temperature of 180° C. is reached, at which reaction begins, when the heat must be moderated by removing the flame heating the sand-bath. The temperature then rises spontaneously to 200°, and this is maintained to the end of the reaction. On cooling, the gray-white mass is dissolved in water, and the filtrate obtained treated with hydrogen sulphide. The yellow precipitate is arsenic sulphide and amounts to 8 or 10 per cent. of the phosphorus used. The author concludes, therefore, that *arsenic is not an element* but a phosphorus compound containing nitrogen, and corresponding in its composition to the formula PN_2O.—Apoth. Ztg., June 9, 1900, 386; from Chem. Ztg., 1900, 483.

Phosphorus—Alleged Conversion into Arsenic.—The foregoing remarkable statement of Fittica has induced Prof. Winkler to publish a criticism, in which he declares Fittica's claim to be absolutely unsupported by facts. The presence of arsenic in commercial phosphorus is well known, and is due to the use of sulphuric acid contaminated with that element. Winkler's determination of arsenic in several different samples of phosphorus

subjected to oxidation in different ways and in separate proportions, to Fittica's treatment, show that, in all instances, the amount was the same, and the supposed convertibility of phosphorus into arsenic, is one of those errors which result from the endeavor to support theories by imperfectly observed facts.—Pharm. Journ., June 23, 1900, 663; from Berichte, *33*, 1693.

Phosphorus—Determination in Organic Compounds.—C. Marie recommends the following method to destroy the organic matter in the determination of phosphorus associated with it. The substance is dissolved in a considerable excess of nitric acid, the solution is heated on a water bath, and a small quantity of finely powdered potassium permanganate is added. This addition is repeated several times, and the red color disappears, until, finally, the red tint persists for five or six minutes. The amount of permanganate requisite will be generally five or six times that of the organic matter. The mixture is then cooled, and a ten per cent. solution of sodium or potassium nitrite is added, drop by drop, until the precipitated manganese oxide is dissolved, and a perfectly clear liquid is obtained. The solution is then heated to drive off nitrous fumes, and excess of nitric acid, and the phosphorus precipitated in the usual way, as phosphomolybdate. Care must be taken to wash the phophomolybdate perfectly free from manganese, otherwise the results will be vitiated, and the magnesium ammonio-phosphate finally obtained will contain manganese. The washings must, therefore, be tested with lead dioxide, and filtration continued until no reaction for manganese is obtained. The method of analysis is much more convenient than the ordinary one of oxidizing in a sealed tube. It has given good results in the analysis of glycerophosphates.—Pharm. Journ., Jan. 27, 1900, 69: from Compt. rend., *129*, 766.

Phosphorus—Estimation in Oils and Fatty Bodies.—E. Louise proposes the following method for the estimation of free phosphorus in fatty substances, which is available even when the phosphorus exists in mere traces: A concentrated solution of silver nitrate is added to the oil in the presence of about twenty times its volume of acetone. The black precipitate obtained is, all other things being equal, proportional to the quantity of free phosphorus present in the oil. Acetone possesses the property of dissolving both oil and water at the same time, hence the drops of aqueous solution necessary to precipitate the phosphorus do not separate out.—Chem. News, Sept. 15, 1899, 135; from Compt. rend., *129* (Aug. 14, 1899), No. 7.

Phosphorus—Determination in Pastes, Etc.—L. Reed recommends the following rapid method for determining phosphorus in pastes, etc., which depends on the formation of PBr_5, when bromine solution is brought in contact with free phosphorus. A solution of bromine in carbon disulphide of known strength—say 10 per cent.— is added drop by drop to a

mixture of the paste with absolute alcohol until a yellow tint produced remains unchanged during a few minutes. From the amount of bromine consumed the quantity of phosphorus is then easily calculated.—Schweiz-Wochenschr f. Phar., 1899, 467.

Phosphorus—Convenient Form for Dispensing. — In the course of preparing phosphorous acid by placing a stick of phosphorus in a test tube having a hole in the bottom, as recommended by Attfield, the apparatus being placed in a somewhat lofty window having a south aspect, F. H. Alcock observes that after a few days all the phosphorus had melted and passed through the hole of the test-tube into the water contained in the beaker, and there formed small round beads about the size of pills and varying in weight from one to seven grains. These have been found to be very useful to hand to elementary pharmaceutical students who require to weigh small quantities of this dangerous article for making pilula phosphori and other extemporaneous preparations containing free phosphorus. It is equally available for making experimental quantities of phosphoric acid and the official hypophosphites. By experiment it was found that the oxidation was so slight as to be almost negligible, and carbon disulphide dissolved the phosphorus as readily as when in the stick form. — Pharm. Joorn., Oct. 28, 1899, 415.

Aluminum Phosphide — Formation and Possible Utility as a Source of Hydrogen Phosphide.—Fonzes-Diacon has succeeded in combining phosphorus and aluminum by igniting, by means of magnesium ribbon, a mixture of amorphous phosphorus and powdered aluminum, in the molecular proportions of the formula P_2Al_2. Even better results are obtained by employing a cartridge of agglomerated aluminum and barium dioxide to start combination of the mixture of aluminum and phosphorus. When this is done in a covered crucible, a friable black mass is obtained, containing a central cone of pure yellowish aluminum phosphide. This body is likely to prove useful as a source of pure hydrogen phosphide, that gas being liberated in large volumes when the phosphide is treated with water. It is not spontaneously inflammable, but ignites on contact with a flame. From the low atomic weight of aluminum, the yield of the gas from a given weight of the phosphide is large. Aluminum forms similar combinations with sulphur, selenium, arsenic and antimony, and all these compounds, when treated with water, give the respective hydrogen gases in a state of great purity.—Pharm. Journ., June 30, 1900, 687; from Compt. rend., *130*, 1314.

Strontium and Barium Phosphides—Production in a Crystalline State, and Characters.—A. Jaboin has succeeded in obtaining the phosphides of strontium and barium by reducing the respective phosphates by means of lamp-black in the electric furnace.

Strontium Phosphide, Sr_2P_3, which is a very stable body in dry air, occurs

as a blackish mass of microscopic crystals, showing a bright, crystalline, reddish-brown fracture. Its density is 2.68; it rapidly decomposes in moist air. Hydrogen is without action on it below the fusing point of glass; it burns in chlorine at about 30° C. Bromine combines with it at 170–175° C., and iodine at a red heat. At a very high temperature carbon replaces the phosphorus, so that during the preparation, exposure in the electric furnace must not be prolonged. Water causes its decomposition with the formation of strontium hydrate and hydrogen phosphide. It is not attacked by strong acids; with oxidizing agents, violent reaction takes place.

Barium Phosphide, Ba_2P_2, is analogous in all respects to the strontium compound, occurring in dark masses of minute crystals, with a brilliant fracture.—Pharm. Journ., Jan. 20, 1900, 41; from Compt. rend., *129*, 762.

Phosphorus Trisulphide—Method of Successful Production.— Edm. Springer says that the preparation of P_2S_3 by melting together the theoretical proportions of sulphur and amorphous phosphorus, usually results in the loss of much of the phosphorus and sulphur and in the formation of a smeary mass containing much phosphorous acid and little phosphorus trichloride. Good results are obtained, however, if a mixture of 62 p. amorphous phosphorus and 96 p. flowers of sulphur are introduced in small portions at a time into a Hessian crucible, heated by a Bunsen burner, under a ventilator, and covered well after each addition. Combustion can rarely be avoided in the first portion placed into the crucible. If this occurs, the flame is extinguished with sand held in readiness for this purpose. The further heating by the Bunsen burner is then dispensed with, the reaction going on without external heat if small portions of the mixture are added and the crucible is immediately covered again—the process after each such addition being ended by feeble decrepitation and development of fumes. Proceeding in this way until all the material is consumed a product is obtained composed of layers of crystalline P_2S_3, which may be easily reduced to powder.—Pharm. Ztg., Feb. 28, 1900, 164.

Phosphorous Acid—Influence on Reactions between Certain Chemicals.—Dr. L. Vanino has observed that phosphorous acid has the property, similarly to that of numerous organic substances, of retarding or preventing certain chemical reactions. Thus, for instance, if 10 Gm. of a 10 per cent. solution of cupric sulphate is mixed with several Gm. of phosphorous acid, the addition of soda solution produces only a faint and transient precipitation, which disappears completely on a further addition of soda. The salts of the alkaline earths, of cadmium, cobalt and nickel, and of iron both in its bi- and tri-valent form, are affected in the same way, alkaline solutions being produced in each case. The exceptions are the metals which produce no hydroxides, consequently, silver and mercuric as well as mercurous salts are not affected. The solutions produced are gen-

erally permanent in presence of soda, but exhibit a variable and occasionally remarkable behavior towards hydrogen sulphide and ammonium sulphide. Thus the solution produced with a manganese salt at first resists the action of hydrogen sulphide, that produced with a ferric salt offers a remarkable resistance against the action of ammonium sulphide, whilst copper solutions fail to react either with soda solution or with ammonium sulphocyanide, though the addition of the merest trace of glucose causes reduction in the latter case.—Pharm. Centralh., Oct. 19, 1899, 637.

Phosphoric Acid—Determination of Lime when Present as Acid Phosphate.—E. H. Gane says that the lime which is frequently present in phosphoric acid made from bone ash in the form of CaH_42PO_4 may be determined volumetrically very quickly by taking advantage of the fact that the sodium acid phosphates react differently to methyl orange and phenolphthalein; using caustic soda to titrate and methyl orange as an indicator, neutrality is reached. If phenolphthalein be now added more soda will be required to neutralize. If the phosphoric acid be free from acid phosphate of lime, exactly the same number of Cc. of soda should be added to neutralize with phenolphthalein as were added when methyl orange was used. If, however, acid phosphate be present, a slight excess will be required, and the difference in number of Cc. of soda added in the two operations will indicate the amount of lime present. Thus: $CaH_42PO_4 + 2NaOH = CaHPO_4 + Na_2HPO_4 + 2H_2O$.—Amer. Drugg., Jan. 10, 1900, 4.

Dried Sodium Phosphate—Uniformity in Preparation.—A. E. Hiss recommends that dried sodium phosphate, which is prescribed considerably, be introduced into the U. S. P., and recommends the following process for making it: Heat crystallized sodium phosphate on a water bath until it ceases to lose weight, stirring the mass until it becomes dry; then continue the heat on a sand-bath, or by direct heat at 120° C., until it again ceases to lose weight, or until 100 parts of the original crystallized salt is reduced to 40 parts.—Bull. Pharm., Dec. 1899, 498.

Sodium Phosphate—Presence of Arsenic in the Commercial Salt.—The "Chemist and Druggist" (June 23, 1900. 1034), calls attention to the occurrence of arsenic in dangerous quantities in a lot of sodium phosphate supplied to Messrs. Alfred Bishop & Co. for the manufacture of effervescent salts. There appears to be some disposition to withhold the source whence the poisonous salt was obtained, and it is therefore suggested that sodium phosphate, from whatever source, be carefully subjected to the test for arsenic. It is mentioned that the Messrs. Bishop have requested the return of all effervescent sodium phosphate of their manufacture supplied by them up to a date in May, 1900.

Referring to the preceding observations concerning the presence of dangerous quantities of an arsenical compound in sodium phosphate, F. C. J. Bird points out the imperative necessity for the immediate examination

of all stocks of this salt, as well as of the effervescent and other preparations made from it. He gives some useful advice concerning the method suitable for its detection in sodium phosphate, in which the arsenic appears to exist as arsenate, and recommends Gutzeit's test, as applied to the detection of arsenic in glycerin by L. Siebold, and subsequently modified by Paul and Cownley (which see under "Arsenic") making the actual test in conjunction with a blank experiment, in which sodium arsenate is used for the purpose of comparison.—Chem. and Drugg., June 30, 1900, 1073.

Soluble Ferric Pyrophosphate—Inefficiency of the U. S. P. Test for the Presence of Orthophosphate.—The statement having been made by a very large manufacturing firm that no "Iron Pyrophosphate, Soluble," on the market would answer the U. S. P. requirements, especially in regard to the absence of orthophosphate, W. E. Ridenour undertook an investigation of the subject, which practically confirms the statement. The official test having been applied to seven samples of the salt obtained from so many different manufacturers, all, apparently, contained the orthophosphate, as did a sample prepared by the author himself, from sodium pyrophosphate, which was determined to be free from orthophosphate by the ammonium molybdate test, as was also the finished iron salt. Various modifications of the U. S. P. test led to no better results: so the author finally adopted the following, which is a slight modification of the test proposed by Julius Stieglitz in 1891 (see Proceedings, 1892, 913), and recommends it to the notice of the Committee on Revision of our next Pharmacopœia: Boil 1 Gm. of the salt with 10 Cc. of potassium or sodium hydrate, T. S., to remove the iron. Filter, acidulate the colorless filtrate with hydrochloric acid, and add a slight excess of ammonia water and a solution of magnesium sulphate (magnesium sulphate, 10 Gm.; ammonium chloride, 20 Gm.; water, enough to make 120 Cc.), so long as a precipitate is formed; slightly acidulate with acetic acid, boil and filter. The filtrate should give no precipitate upon adding ammonia water in slight excess.

In this way the author found his own sample of soluble ferric pyrophosphate to be absolutely free from orthophosphate, as was also a sample handed him by a fellow chemist with a guarantee of purity. The seven manufacturers' samples, however, all gave indications of the presence of orthophosphate, two giving heavy, three very heavy, and two small precipitates under the conditions of the test, as well as by the additional test with ammonium molybdate. He concludes that "iron pyrophosphate soluble" does not revert during the process of manufacture into orthophosphate, and that the presence of the latter is due to the carelessness of the operator.—Amer. Journ. Pharm., March, 1900, 125–129.

BORON.

Boric Acid.—Untoward effects when used as a preservative in *Milk*, which see under "Organic Chemistry."

Borates—Volumetric Determination.—Jules Wollf employs a solution of ferric salicylate in sodium salicylate as an indicator for the titration of boric acid and its salts. In the case of borax, for instance, the solution is treated with a known volume of standard acid, in excess, the salicylate indicator is then added, and the free acid is titrated until the violet tint is replaced by a clear madder-red color. The end reaction is very sharp. In the presence of ammonium salts, an excess of soda is first added and the ammonia driven off by heat, before adding the acid. The indicator is prepared as follows: 5 to 6 Gm. of sodium salicylate are dissolved in 25 Cc. of distilled water, solution of ferric chloride is added, drop by drop, until a slight permanent turbidity results, the solution is filtered, and divided into two equal parts; to one of these sufficient dilute soda solution is added to give a deep orange tint, the other is sensitized with acid to the point of developing a red tint; the two are then mixed, and 10 Gm. of sodium salicylate dissolved in the mixture.—Pharm. Journ., June 23, 1900, 663; from Compt. rend., *130*, 1128.

Borates—Improved Flame-Method of Detection.—According to H. Borntraeger, he finds that when borates are heated with fluoric acid alone, or with ammonium nitrate and chloride, or with sulphuric and hydrochloric, or sulphuric and nitric, or nitric and hydrochloric acids, the flame of a Bunsen burner is *at once* turned a handsome green, whereas this color is developed only after a time if the customary method, alcohol and sulphuric acid, is employed in connection with borates.—Apoth. Ztg., May 2, 1900, 294; from Ztschr. Anal. Chem., 1900, 92.

Sodium Borate—A General Poison Antidote when Given with Milk.—Ed. Crouzel recommends as a general antidote to poisons a 5 per cent. solution of sodium borate in cold milk, and explains its utility for this purpose on the following grounds: The sodium borate precipitates with few exceptions as insoluble borates all bases with the exception of the non-toxic or moderately toxic ones. The poisonous acids decompose it, combine with the sodium, and set free the non-toxic boric acid. It thus fills the conditions which may be properly expected from a general antidote, though it cannot by any means be regarded a universal antidote. The milk, by virtue of its fat and casein content, protects the mucous membranes from the corrosive action of acids, of bases and other corrosive or simply irritant bodies. The casein is of great chemical value; it reacts both as acid and base in the presence of the substances coming in contact with it. Under the influence of acids it is coagulated, forming compounds, whilst with most bases it forms precipitates of insoluble caseinates. If insoluble products of either acid or base are not immediately formed, the products formed will produce such by reaction upon each other. The poison is

therefore precipitated, on the one hand, as an insoluble compound, and on the other it is enveloped by the components of the antidote named. The antidote is suitable only for mineral poisons, excluding those having an alkaline base, and it is valueless also in the treatment of poisoning by substances of animal or vegetable origin. The first step in the treatment consists in removing the poison as far as possible by means of emetics, etc., the next to administer the cold milk solution of sodium borate, the third to tone up the system by the use of appropriate remedies. For this purpose the author recommends a mixture of equal parts of a cold concentrated infusion of roasted coffee and of cinchona bark, to which a little spirit of ether is added.—Pharm. Post, Aug. 20, 1899, 454; from Rép. de Pharm.

Metallic Borates — Preparation. — The difficulty of preparing metallic borates is overcome by L. Ouvrad by taking advantage of the fact that when boric anhydride acts on metallic chlorides, the chlorinated compounds are only formed to a very slight degree, still less in the case of the fluorides. The double fluorides of the metals with the alkalies are used, as they are soluble and more easily fusible. Cadmium borate was one of the first the author prepared. Equimolecular parts of fluorhydrate of potassium fluoride and boric anhydride, to which was added a molecule of cadmium oxide, were placed in a platinum crucible. These were heated together for some time and then fused. Boron fluoride was evolved. When all the gas was given off and the whole was in tranquil fusion, it is allowed to cool slowly, and taken up with water. Needles of tri-cadmic borate were left; these crystals are insoluble in water, but easily soluble in dilute acids. Analysis shows them to have the formula $B_2O_3.CdO$.—Chem. News, Feb. 16, 1900, 83; from Compt. rend, *130* (Jan. 22, 1900), No. 4.

CARBON.

Calcium Carbide—Estimation of Acetylene Yield.—G. Hanekop effects the estimation of the value of calcium carbide on the basis of the quantity of acetylene produced, employing an apparatus similar to that employed for the estimation of carbon dioxide. The calcium carbide having been introduced, water is allowed to drop on it in quantities of 5 to 6 drops per minute, thereby avoiding too great a rise in temperature and consequent loss of water by vaporization. When the reaction is completed the apparatus is weighed, the loss in weight giving the quantity of acetylene yielded by the sample.—Pharm. Centralh., Sept. 14, 1899, 561; from Ztschr. f. Angew. Chem., 1899, 594.

Calcium Carbide—Color due to Traces of Iron.—The color of calcium carbide, as well as of the carbides of strontium and barium, was described by H. Moissan when he first prepared them as being reddish-brown. Since then he has succeeded in preparing calcium carbide in the form of white, transparent crystals, and has found that when it has a reddish-

brown appearance, this must be attributed to the presence of iron; a trace of this metal being sufficient to produce the coloration.—Chem. News, Feb. 9, 1900, 67; from Bull. Soc. Chim. (3). xxi, No. 22.

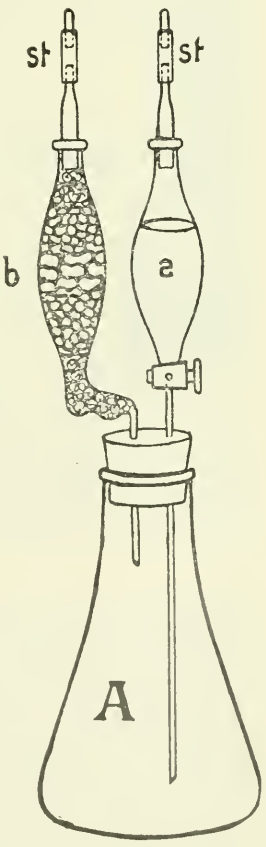
Carbon Disulphide—Preservation in Glass Stoppered Containers.—W. Elborne examined a flocculent deposit which had formed in a cork stoppered bottle of carbon disulphide left unopened but exposed to strong diffused sunlight. This deposit was apparently due to impurities derived from the cork, and he suggests therefore that carbon disulphide be preserved in glass-stoppered bottles and not exposed to direct light.—Trans. Brit. Pharm. Conf., 1899, 453–454.

Carbonic Acid—Compounds with Water, Ethyl Oxide and the Alcohols.—A compound of carbonic acid and water, having for its formula $CO_2 + 8H_2O$, has already been described. W. Hempel and J. Seidel obtain it by placing a certain quantity of water in a thick tube, cooling to —80° C., and adding carbonic acid snow; the tube is then sealed up and allowed to return to the ordinary temperature. We notice that the contents of the tube separate into two liquid layers, the water below and the carbonic anhydride above. At the same time crystals having the above-mentioned formula are deposited; these melt at 8° C. at a pressure of 43 atmospheres, and decompose between —2° and — 20° C. at the normal pressure. Carbonic acid snow also dissolves in ether; if it is added to water saturated with ether a white precipitate is obtained; the composition of this substance is variable and depends on the temperature of the mixture. At —50° C. it is represented by the formula $(C_2H_5)_2O \cdot CO_2 \cdot 4H_2O$. Liquid carbonic acid unites with the alcohols, giving compounds fusible above the freezing-point of alcohol. Thus the compound, $CO.OH.OCH_3$, solidifies at —79° C. and melts at —60° C.; that of ethylic alcohol $C_2H_6O - CO_2$, melts at about —61° C., and that of amylic alcohol at —56° C.—Chem. News, Oct. 20, 1899, 195; from Berichte, Dec. 12, 1898.

Carbonic Acid—Rapid Estimation in Mixtures of Various Gases.—Leo Vignon and Louis Meunier recommend the following method as being convenient and rapid for estimating carbonic acid in gaseous mixtures: A solution of lime of known strength and reddened with phenolphthalein, is introduced, a little at a time, into a flask containing a mixture of neutral gases with carbonic acid. The rose color of the lime water is discharged as long as free carbonic acid is present, but remains when the latter has become saturated. The operation is rendered more rapid and complete by adding a little ethyl alcohol, which facilitates the formation and precipitation of calcium carbonate. From the amount of lime-water consumed the quantity of carbonic acid is easily calculated, a deduction being made for the amount required to develop the phenolphthalein color.—Chem. News, March 16, 1900, 131; from Compt. rend., *130* (Feb. 19, 1900), No. 8.

Carbonic Acid — Determination in Limestone, Bone-Dust, &c. — V. Schenke has modified the method of Fr. Mohr for the determination of carbonic acid in numerous minerals by substituting for the sulphuric acid, commonly employed for liberating and drying the carbonic acid, hydrochloric acid and calcium chloride. The reaction takes place in the cold, hence the amount of water vapor carried by the carbonic acid is reduced to a minimum. The substance to be examined is introduced into the flask *A*, Fig. 73, together with a few Cc. of water: the bi-perforated stopper, bearing the acid bulb, *a*, and the drying bulb, *b*, is then inserted, and both being suitably charged—*a* with hydrochloric acid of 25 per cent., and *b* with pieces of calcium chloride and an intermediate layer of copper sulphate and recently calcined fragments of pumice—the whole apparatus is weighed. The acid is then allowed to flow into *A* from *a* under the usual precautions, and air is aspirated through the apparatus by connecting with a suction-pump, until the evolution of carbonic acid ceases, when the apparatus is again weighed and the loss calculated as carbonic acid. The object of interposing a layer of copper sulphate and anhydrous pumice is to arrest any hydrochloric acid that may be drawn into the drying bulb by the suction produced. In the presence of *sulphides*, *sulphites* and *hyposulphites* it is necessary to add potassium chromate in excess to the contents of *A* for the purpose of converting the liberated hydrogen sulphide and sulphurous acid into sulphuric acid.—Pharm. Centralh., Oct. 12, 1899, 629.

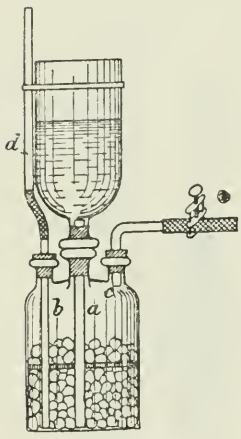
Fig. 73.



Gas Generator — Simple and Inexpensive Construction.—Dr. J. Katz recommends in place of the expensive Kipp generator of usual construction, the one shown by Fig. 74, which is readily made with inexpensive material usually contained in the laboratory. Into the central opening of a three-necked Woulf's flask a rather wide glass tube, *a*, is fitted and surmounted by a bottle, the bottom of which has been broken off, which is held in place by means of rubber-tube. A smaller tube, *b*, is then introduced into one of the other tubulures through a rubber stopper, and attached by a short piece of rubber tube to a second, somewhat longer tube, *d*, so that when released from its upright position—maintained by means of a rubber band—and dropped down, it

will act as a syphon for the withdrawal of the liquid contents of the Woulf flask. Coarse fragments of glass are then introduced to a little over one-third the height of the bottle—then water to nearly the same level, followed by a quantity of paraffin in pieces small enough to pass through the third tubulure, *c*. The flask is now placed into a hot water bath, so that the paraffin may melt and form a layer about 1 Cm. in thickness. It is then removed, slightly inclined by placing a piece of board (about 1 Cm. thick) under one edge of the flask, and the contents are allowed to cool. The water is then withdrawn, leaving a solid diaphragm of paraffin, slightly inclined in one direction, and resting upon the layer of broken glass. According to the gas to be generated, pieces of marble, zinc, or ferrous sulphide are then placed through the tubulure, *c*, on the surface of the paraffin diaphragm ; a short tube bent at right angles is inserted into *c*, and is attached to the delivery tube by means of a short piece of rubber tube, bearing a screw pinch-cock. On filling the supply bottle with acid and opening the pinch-cock, the acid passes through *a* into the interior and through a small hole, previously made through the paraffin layer, reaches the material from which the desired gas is generated—the flow of gas being regulated by the greater or less unscrewing of the pinch-cock, or stopped altogether by screwing it up tight. In the latter event, the pressure of gas will cause a portion of the acid liquid to return into the supply bottle, and its action upon the contents in the upper chamber will cease. When the acid is exhausted, it is readily removed by lowering the syphon tube *d*.—Pharm. Ztg., Nov. 29, 1899, 852.

FIG. 74.



Gas Generator.

CYANOGEN.

Hydrocyanic Acid—Formation by the Action of Carbonic Acid Upon Potassium Ferrocyanide.—Guido Gigli states that if we pass a current of carbonic acid through a cold solution of potassium ferrocyanide there is no apparent effect ; but if the solution is then submitted to distillation, it becomes cloudy as soon as the boiling point is reached, and we observe that the filtered liquid contains hydrocyanic acid. A fresh current of carbonic acid through the cloudy solution produces no effect, but if it is filtered the clear filtrate will then behave in the same manner as the original solution. This cycle of operations, action of carbonic acid gas, boiling, filtration and cooling, can be repeated a large number of times ; the quantity of ferrocyanide decomposed or of hydrocyanic acid produced in each operation is extremely small, but sufficient to interfere with the

use of carbonic acid as a means for the detection of potassium cyanide in the ferrocyanide (Fresenius's method). The greenish precipitate which is formed seems to be the product known under the name of "Everett's white salt."—Chem. News, Feb. 16, 1900, 83; from Chemiker Zeitung, xxii, 775.

Hydrocyanic Acid—Estimation in Presence of Ferro- and Ferri-Cyanides.—H. Beckurts records experiments which prove the reliability of Jacquemin's method for the estimation of hydrocyanic acid and poisonous cyanide in the presence of non poisonous ferro- and ferri cyanides. The method consists in cautiously distilling the suspected substance in a retort, the neck of which is pointed upwards diagonally and connected with a Liebig's condenser, with a concentrated solution of sodium bicarbonate either by itself or in a current of carbon dioxide, and then estimating the hydrocyanic acid in the distillate in the usual way. A necessary condition, however, is that the temperature of 60° C. be not exceeded during the distillation.—Apoth. Ztg., Feb. 14, 1900, 109.

Potassium Cyanide—Commercial Quality.—Charles H. LaWall and Robert C. Pursel report the results of assay of nine commercial samples of potassium cyanide. They call attention preliminarily to the trouble experienced by the analyst from the presence of impurity which causes a darkening of the solution when titrated with silver nitrate V. S., thus obscuring the end reaction. Also to the fact that, owing to the presence of sodium cyanide, which requires a lower calculating factor, more than 100 per cent. of KCN may be indicated in a sample, notwithstanding the invariable presence, to some extent, of carbonates and moisture. The U. S. P. standard is 90 per cent. KCN. The average percentage in the nine samples was 97.22, the minimum being 91.15, and consequently within pharmacopœial limits, while the maximum was 100.40, this excess being doubtless due to the calculation of sodium cyanide present as KCN.—Amer. Jour. Pharm., Aug. 1899, 395; Proc. Penna. Pharm. Assoc., 1899, 156.

Ammonium Cyanate—Preparation in Solid Form and Properties.—Prof. Walker states that solid ammonium cyanate cannot be prepared by recrystallization on account of the extreme readiness with which it passes into urea. When, however, ethereal solutions of cyanic acid and ammonia gas are mixed and cooled by means of a freezing mixture, the solid ammonium cyanate falls as a voluminous precipitate. In the absence of a freezing mixture the heat of formation rapidly effects the conversion into urea. So obtained the cyanate keeps for months in the dry state if well corked. On exposure to air it passes to urea in an hour or two. The transformation becomes more rapid as the temperature rises, and at 80° C. the transition is instantaneous.—Pharm. Journ., Nov. 25, 1899, 512; from Proc. Chem. Soc., Nov. 16, 1899, 9.

Mercuric Oxycyanide—A Substitute for Corrosive Sublimate as a Disinfectant and Antiseptic.—Dr. von Pieverling called attention at the meeting of the Society of German Naturalists and Physicians (Sept. 18, 1899) to mercuric oxycyanide as a disinfectant and antiseptic agent, in surgical and gynæcological practice. It possesses the advantage over corrosive sublimate that, while an equally energetic agent, it exercises no corrosive action upon nickel-plated instruments. The author has introduced the substance into use in the form of tablets, each containing 1 gramme of the oxycyanide, composed of 2 mol. of mercuric oxide and 3 mol. of mercuric cyanide. This he finds the most efficient of the four different mercuric oxycyanides that have heretofore been described. A 1 gramme tablet, when of proper composition, should dissolve perfectly by shaking with 6 Cc. of water within one minute, leaving undissolved only the small proportion of coloring matter which may have been added.—Apoth. Ztg., Sept. 23, 1899, 561.

ALKALIES.

Potassium—Volumetric Estimation as Cobaltinitrite.—R. H. Adie and T. B. Wood determine potassium volumetrically by precipitating it as cobaltinitrite and titrating this in acid solution with a standard solution of potassium permanganate. The cobaltinitrite is usually represented as $K_6CO_2(NO_2)_{12}.3H_2O$. The author's experiments appear to show, however, that there are three instead of two nitrite groups for each atom of potassium, and that the precipitate obtained is an acid salt, the formula indicated being $K_2HCO(NO_2)_6$. Other bases being removed as far as possible, by means of sodium carbonate, the solution of the potassium salt under examination is concentrated if at all weak, acidified with acetic acid, and an excess of sodium cobaltinitrite solution added. After the mixture has been allowed to stand for twenty-four hours, the precipitate is collected on a Gooch filter, washed several times with 10 per cent. acetic acid and, finally, once with water. The asbestos filter and the precipitate are then transferred to a beaker and boiled with a dilute solution of soda, filtered, and made up to 100 Cc. Of the solution so obtained, 20 Cc. are acidified with dilute sulphuric acid and rapidly titrated with permanganate solution; then, for the purpose of control, add the amount of permanganate solution just found to a second portion of 20 Cc. of the nitrate solution, then acidify, and again determine the end point. The end of the reaction is more easily obtained if the permanganate is added to the nitrite solution in excess and the excess determined by potassium iodide and thiosulphate solution. In an experiment recorded, the volumes of permanganate required were 16.3 and 16.4 Cc. respectively.—Pharm. Journ., Feb. 24, 1900, 171; from Proc. Chem. Soc., *16*, 17.

Sodium Bicarbonate—Temperature of Liberation of Carbon Dioxide.—C. S. Dyer has experimented to determine the temperature at which so-

dium bicarbonate loses a portion of its carbon dioxide. His results lead him to doubt the accuracy of the statement made by Mr. Cowie last year (see Proceedings, 1899, 624) that the salt decomposes at a temperature between 50° and 60° C. While he has no doubt that Mr. Cowie's experiments were perfectly accurate, the finding of traces of CO_2 by a delicate test on exposing a bicarbonate to a temperature of about 55° C. is, in his opinion, not sufficient ground for declaring that the salt decomposes at that temperature to any practical extent, and probably the traces of CO_2 merely came over with the small amount of moisture usually present. At temperatures below 100° C. dry sodium bicarbonate decomposes slowly, below 60° scarcely at all, and above 120° decidedly rapidly.—Trans. Brit. Phar. Conf., 1899, 459–462.

Laundry Soda—Various Compositions.—According to the "Seifenfabrikant," the constituents of commercial laundry soda vary considerably. Various manufacturers prepare it by mixing sodium silicate, 2.5, with calcined soda, 1, and powdering the resulting hard mass. Another form is composed of calcined soda, 34; sodium silicate, 25; borax, 3; soap powder, 5; starch powder, 3; water, 30. Another usual formula is crystal soda, 4, sodium silicate, 1, though very often it only consists of powdered soda crystals.—Pharm. Zeit., 1900, 88.

Liquid Ammonia—Use as a Solvent.—J. C. Swayze and L. E. Sayre call attention to the value of liquid ammonia made by compression and refrigeration as a general solvent for both organic and inorganic substances. Weyl and Seeley were the first to investigate the solvent process of liquid ammonia, but their work was not extensive. Interest was aroused, however, by G. Gore, in 1872, who undertook the work on a broader basis, experimenting upon nearly three hundred and fifty substances, both for the purpose of ascertaining the general solvent powers of liquid ammonia and its power of chemical reaction. It was found that the liquid was one of the best solvents known for both organic and inorganic substances. The only elements which were found to be soluble were the alkali metals, iodine, sulphur and phosphorus. Most of the salts were soluble, especially the nitrates, chlorides, bromides and iodides: while the oxides, fluorides, carbonates, sulphides and sulphates were generally insoluble. These experiments were carried on under much more unfavorable conditions than are now available for the same work. Faraday tubes were used, in which ammonia was generated by heating dry ammonio chloride of calcium, and condensed by refrigeration and its own pressure. To-day the liquid ammonia is furnished in convenient cylinders, and it was with these modern conveniences that Prof. Franklin and Mr. Kraus, of the Kansas State University, succeeded in duplicating all of Gore's results and examining many other substances. By their method of determination, by the aid of small Dewar tubes, the experimenters ascertained the solubilities in liquid ammonia of many substances common in pharmacy, such as alcohol,

ethers, aldehydes, ethereal salts, nitrogen compounds, and phenols. They find, moreover, that liquid ammonia very closely resembles water in all of those properties which give to water its conspicuous position among solvents. It closely resembles water in its power of dissociating electrolytes. In many compounds it plays the part analogous to that of water in salts containing water of crystallization. It resembles water in that it has a relatively high critical temperature, critical pressure and boiling point. It differs from water in its inability to dissolve the sulphates and sulphites, the alkaline carbonates, phosphates and oxalates, the hydroxides of the alkalies and alkaline earths, and the facility with which it dissolves many organic substances, in which latter respect it resembles alcohol rather than water. It also differs from water in not exhibiting the maximum density above the freezing point. Neither is the solid ammonia specifically lighter than the liquid. Liquid ammonia itself will not conduct electricity, but solutions of substances in ammonia are often better conductors than aqueous solutions of the same substances.—Drugg. Circ., July, 1899, 148.

Ammonia—Determination by Modified Nessler's Reagent.—L. W. Winkler, referring to a colorimetric method proposed by him for determining ammonia by means of Nessler's Reagent (Phar. Centralh., 1899, 412) observes that the reaction cannot be carried out with that reagent as ordinarily prepared with mercuric chloride, the presence of potassium chloride interfering with the development of color and producing only a very pale yellow precipitate. The difficulty is overcome by substituting mercuric iodide for the chloride, as follows: 10 Gm. mercuric iodide, 5 Gm. potassium iodide, 20 Gm. sodium hydroxide and 100 Cc. water. The mercuric salt is triturated finely with a portion of the water, carefully washed into a flask, the potassium iodide added, and then the sodium hydroxide, dissolved in the remainder of the water and cooled, is added. The solution is clarified by subsidence and preserved in the dark. If the water to be examined for ammonia is so hard as to produce a precipitate with Rochelle Salt it must be diluted with water free from ammonia.—Pharm. Centralh,, Aug. 17, 1899, 509; from Chem. Ztg., 1899, 541.

Ammonia — Simple Method of Titration in Gas Liquors. — Lubberger recommends the titration of ammonia in gas liquors by the following simple process: Three fragments of pure lime, about the size of a nut, are introduced into a flask of 400 Cc. capacity, which is half filled with the liquid to be titrated; the mixture must be shaken, and becomes of a reddish brown color. When all the lime is used up, the mixture is cooled, and 50 Cc. filtered off into a graduated flask. The filtered liquor is poured into a beaker, and titrated with deci-normal hydrochloric acid until the color changes from brown to pale yellow. Of the total acid used, subtract the quantity necessary to saturate the lime in 50 Cc.; the remainder corresponds to the ammonia contained in the liquor under examination. When operating on 50 Cc., 1 Cc. of deci-normal acid corresponds to 17

Gm. of ammonia in 100,000 parts of liquor. The solubility of the lime in the liquors in question is evidently variable according to the gas-works. It is therefore indispensable to determine it by a certain number of tests, and to take the mean of the results. — Chem. News, July 28, 1899, 37 : from Journ. f. Gasbeleucht., 1899, xliii., 1.

Ammonia — Determination as Chloride. — A. Villiers and E. Dumesnil recommend the gravimetric determination of ammonia as chloride, in preference to the usual methods of alkalimetric titration, the ammonia evolved on distillation with alkali being passed into a weak solution of hydrochloric acid ; this is evaporated to a small bulk and transferred to a conical flask, evaporation and desiccation being completed by exposure to a temperature of 105° C. in a drying oven for twenty hours, in which time all water and free hydrochloric acid are completely eliminated, but no ammonium chloride is lost. The following precautions are obviously necessary in the application of method : First, that the apparatus employed in distilling does not allow alkali spray to be carried over mechanically. Those devised by Schloesing or by Aubin and Alla are recommended. Secondly, that the soda or potash employed is free from ammonia ; this is frequently present in the so-called pure alkalies. Thirdly, the fact that the hydrochloric acid used is perfectly free from residue should be experimentally determined. The method is equally available for the Kjeldahl and the soda-lime methods of nitrogen determination. — Pharm. Journ., March 31, 1900, 433 ; from Comptes rend., *130*, 579.

Ammonium Carbonate — Variable Composition.—Edmund White, in the course of determining the quality of the material employed in an investigation dealing with "Aromatic Spirit of Ammonia," examined a number of samples of ammonium carbonate, and found none of them to come up quite to the standard of the B. P. 1898. This is 31.68 per cent. NH_3, while the highest result obtained was 30.83 per cent., and the lowest 28.46 per cent., the sample being in each case taken from the centre of fairly large translucent lumps. As is well known, the result of prolonged exposure of ammonium carbonate is to reduce the percentage of ammonia from about 32 per cent. to 21.58 per cent. ; this being due to the disappearance of the ammonium carbonate, which dissociates into ammonia and carbon dioxide, and leaves a white, efflorescent residue of ammonium hydrogen carbonate (bicarbonate) It is not so clear, however, why perfectly translucent samples taken from the interior of lumps showing very little superficial efflorescence should vary in the percentage of NH_3 they contain, such variation having been observed in samples taken from the same jar. The author's observations confirm those of P. Squire, who states that different samples of ammonium carbonate examined by him gave 91 to 96 per cent. of the prescribed amount of NH_3.—Pharm. Journ., Feb. 17, 1900, 144.

Lithium — Distribution in Plants.—E. Tschermak finds lithium to be a

much more widely diffused element in the vegetable kingdom than has hitherto been supposed. It was detected chiefly in the leaves, the finer portions of the stem, the flower, and the fruit.—Pharm. Journ., June 30, 1900, 687; from Ztsch. Landw. Vers-Wesen. Oesterreich., *2*, 560.

Lithium.—Electrolytic Method of Preparation.—Louis Kahlenberg, remarking preliminarily that the reason why metallic lithium cannot be obtained from aqueous solutions of its salts by electrolysis is that the metal reacts with water, states that in pyridine he has found a solvent for lithium chloride, which, being an electrolyte, enables the electrolytic preparation of the metal, notwithstanding that the electrical conductivity of such a solution is slight as compared with that of aqueous solutions. By the simplest method of operation he has obtained the lithium in white metallic form at the ordinary temperature of the room, the method being described as follows: A concentrated solution of lithium chloride in pyridine is placed in a beaker into which dip a carbon plate (anode) and a bright iron plate or foil (cathode). Platinum or some other metal may, of course, also serve as cathode, though when used as anode a metal (even platinum) is apt to be attacked and some of its substance carried over to the cathode. No diaphragm is necessary. With a difference of potential of but 14 volts between the electrodes, a current of from 0.2 to 0.3 ampere per 100 sq. Cm. of cathode area will soon deposit a dense, well-adhering, silver-white coating of metallic lithium. The deposit thus obtained possesses all the well-known physical and chemical properties of the metal. Lithium, being an alkali metal that is not very plentiful in nature, has thus far not found use in practical life in the metallic form; nor are the indications at present such that it will be used in practice. By means of the described method the metal can readily be obtained from the relatively cheap chloride in quantities sufficient for most scientific purposes.—Chem. News, March 30, 1900, 146; from Mic. Engineer, 1899, iii., 2.

Cæsium—Specific Gravity.—Having recently, in collaboration with Prof. Hugo Erdmann, made cæsium on a large scale, A. E. Menke has determined the specific gravity of the metal after purification by several redistillations in hydrogen. The metal was weighed in hydrogen and then under liquid paraffin, and in six closely concordant results the sp. gr., referred to water, was determined to be 2.40003. Many years ago, Setteler determined the sp. gr. to be 1.88, working, however, with small quantities (0.6 to 1.1 Gm.) of the metal.—Chem. News, March 16, 1900, 125; from Amer. Chem. Soc., xxi., No. 5.

ALKALINE EARTHS.

Crystallized Calcium—Preparation.—According to Henri Moissan, crystallized calcium can be prepared by two methods. To obtain it in a state of purity he makes use of the property, hitherto unknown, of dissolving metallic calcium in liquid sodium kept at a dull red heat. On cooling,

the calcium crystallizes out, and, by treating the metallic mass with absolute alcohol, brilliant white hexagonal crystals of pure calcium remain. 600 Gm. of anhydrous crystallized calcium iodide are placed, with 240 Gm. of sodium, in an iron crucible of 1 liter capacity; this is closed with a screw-down cover, and heated to dull redness for an hour. On cooling, the crucible is found to contain a layer of melted salt of a blue color, covered by a cake of metallic sodium. This sodium, broken up to fragments of about 1 Cc., is added to 500 Cc. of anhydrous absolute alcohol, kept at 0° in a 1 liter flask. The return of calcium is about 50 per cent. of the theoretical amount. Similar crystals of calcium can be obtained by the electrolysis of melted calcium iodide at a dull red heat. The negative electrode is of pure nickel and the positive of graphite. Under these conditions a white melted, or crystalline, metal is obtained.—Chem. News, March 9, 1900, 119; from Bull. Soc. Chim. (3), xxi., Nos. 20–21.

Calcium Hydride — Preparation and Properties. — Henri Moissan has prepared calcium hydride as follows: Pure crystallized metallic calcium is placed in a nickel boat into a tube traversed by a current of pure dry hydrogen. On raising the temperature of the calcium to a dull red, it takes fire in the atmosphere of hydrogen. The gas is rapidly absorbed, and a white substance is formed, which is hydride of calcium. This hydride is stable at a high temperature, and is an energetic reducing agent; its formula is CaH_2. On contact with water it decomposes with violence. In this compound the hydrogen is comparable with the metalloids (carbon or phosphorus) and not with the metals. There are in reality two series of hydrides, in one of which the hydrogen seems to be in solution in the metals; and the others forming at a more or less elevated temperature, having all the characteristics of definite chemical compounds. The author has also prepared .

Calcium Nitride in a similar manner. When a fragment of pure crystallized calcium is placed in an atmosphere of pure dry nitrogen, no change takes place in the cold, but on raising the temperature there is at first a slow absorption of gas and a change of color in the metal, which gradually becomes yellow, then bronze. On further increasing the temperature the color deepens, and at a dull red heat the combination takes place with incandescence. When the reaction takes place at about 1200° the compound obtained is crystalline; it answers to the formula N_2Ca_3. It reacts readily with chlorine, bromine, iodine, oxygen, sulphur, and phosphorus, and is destroyed by carbon at a high temperature. With anhydrous alcohol it gives ammonia and calcium ethylate. It also decomposes on contact with cold water, giving off ammonia. — Chem. News, March 16, 1900, 131; from Bull. Soc. Chim. (3), xxi., Nos. 20–21.

Calcium Chloride—Purification.—Solutions of calcium chloride accumulating from the generation of carbon dioxide when marble dust and

hydrochloric acid are used for the purpose, contain chiefly ferrous chloride as impurity. F. H. Alcock observes that the purification of this solution is usually effected by the aid of chlorinated lime, but that if care be not used, a trace of this compound will usually be found in the final product. A very simple plan, which has proved successful in the author's hands, is to evaporate the solution of crude calcium chloride slowly in a large evaporating dish to perfect dryness, raising the temperature until a light porous mass is obtained. On cooling and solution in distilled water and subsequent filtration, the filtrate will be found perfectly neutral, and free from iron compounds.—Pharm. Journ., May 19, 1900, p. 524.

Marble—Use as a Standardizer.—John P. Catford calls attention to the value of marble as a standardizer for hydrochloric acid, its advantage for this purpose over sodium carbonate, for instance, being that it is not subject to undergo changes or variations due to hygroscopy. It is necessary, of course, to establish its exact relation to the acid, since it is not entirely free from impurities, such as magnesium carbonate, silica, etc. But the factor having been once established, the same sample will answer for the purpose of standardizing the acid as long as it lasts, and will prove fully as reliable as the one always used for different samples of iron wire.—Ch m. & Drugg., Jan. 13, 1900,69.

Calcium Carbonate—Advantages of the Precipitated over Prepared Chalk.—Carles observes that precipitated chalk is shown under the lens to be composed of amorphous grains of uniform size, whereas prepared chalk is shown to be composed of distinct transparent crystals in a mixture of amorphous and opaque agglomeration. If a mixture of 10 Gm. of the chalk and 50 Gm. of water is treated with pure hydrochloric acid, gradually added in the cold, the precipitated chalk dissolves with uniform rapidity and yields a perfectly clear and colorless solution, whereas prepared chalk dissolves very slowly towards the end of the reaction and yields a turbid, more or less yellow solution. If then the carbonic acid is eliminated by boiling the solution and ammonia is added to saturation, that obtained from precipitated chalk exhibits only a faint precipitate, whereas in the solution obtained from prepared chalk a voluminous cloudy precipitate is formed, having a more or less yellow color, due to the presence of iron.—Pharm. Post, July 25, 1899, 357; from Bull. Soc. de Phar. de Bordeaux.

Calcium Carbonate — Presence of Formic Acid in a Manufactured Sample.—J. Walther has determined the presence of formic acid in a so-called "calcium carbonicum præcipitatum" obtained by passing carbonic anhydride into milk of lime to saturation. The carbonic anhydride for this purpose was obtained by heating limestone to redness. Evidently the carbonic oxide produced along with the carbonic anhydride had united with the calcium hydrate to form calcium formate, according to the following equation: $Ca(OH)_2 + 2CO = Ca(HCO_2)_2$. The quantitative

determination of the formic acid was effected by saturating the calcium carbonate with phosphoric acid, passing water-vapor through the mixture and titrating the acid distillate so obtained.—Pharm. Centralh., Oct. 26,, 1899, 656 ; from Chem. Ztg., 1899, Rep., 284.

Gypsum—Theory Concerning the Process of Hardening.—The conditions that determine the hardening of calcined gypsum have been the subject of numerous studies and investigations, which have given rise to various and conflicting theories concerning the process. Prof. Karl Zulkowski, accepting the view already advanced by Le Chatelier, that both in the dehydration and the subsequent re-hydration of gypsum certain chemical processes are involved, has made experiments in this direction which have led to the following results :

The hardening of ordinary calcined gypsum depends upon a chemical process, which consists in the assimilation of two molecules of water by the original calcium compound, and the consequent formation of a more difficultly soluble body, viz., the *calcium salt of hexahydroxylsulphuric acid.* Gypsum, when calcined at a moderate red heat is also capable of assimilating water and hardening ; but in consequence of its greater density, it is capable of assimilating only a single molecule of water, the *calcium salt of tetrahydroxylsulphuric acid* being formed.

In both cases the water exercises a double function in the hardening process. It primarily seeks to dissolve the original, more readily soluble calcium compound, then enters into chemical combination and forms a difficultly soluble body, which separates in crystalline form and hardens to a compact mass.—Apoth. Ztg., Sept. 2, 1899, 504 ; from Chem. Ind., 1899, 349.

Magnesium—Action on Water in Presence of Salts.—Georges Lemoine finds that magnesium decomposes water very slowly at ordinary temperatures, but in the presence of certain salts, and with the magnesium in the form of powder, the action becomes very lively. Taking, for example, the chloride, the following action probably takes place : $MgCl_2 + mMg + mH_2O = MgCl_2 + mH_2 + mMgO$. The author has measured the gas evolved after varying times, and has studied this reaction thermochemically.—Chem. News, Sept. 8, 1899, 123 : from Compt. rend., 129 (July 31, 1899), No. 5.

Magnesium—Volumetric Estimation. — A new and reliable method for the volumetric estimation of magnesium is recommended by R. K. Meade, which depends upon the precipitation of magnesium as ammonium-magnesium arsenate, the reduction of the arsenic in the precipitate to the arsenous condition by means of potassium iodide in an acid solution, and the titration of the iodine liberated during the reaction with $\frac{N}{10}$ thiosulphate, one Cc. of which equals 0.002013 Gm. MgO. To carry out the estimation, pour the solution — which should not contain too great an excess of

ammonium chloride or ammonium oxalate—into a flask of sufficient capacity. Add one-third the volume of strong solution of ammonia and 50 Cc. of 10 per cent. solution of sodium arsenate. Cork tightly, and shake vigorously for ten minutes. After subsidence, collect and wash the precipitate on a filter with a mixture of 3 parts of water and 1 part of ammonia water until the washings cease to react for arsenic, avoiding the use of an excess of the washing fluid, however. Then dissolve the precipitate in dilute hydrochloric acid, collecting the solution in the flask in which the precipitation was made, and wash the filter with dilute acid until the washings and solution measure 75 to 100 Cc. Cool the solution, add 3 to 5 Gm. of potassium iodide — which must be free from iodate — and, after allowing the solution to stand a few minutes, titrate the liberated iodine with thiosulphate in the usual way.—Jour. Amer. Ch. Soc., *21*, 747.

Magnesium—Volumetric Determination.—A volumetric method for the determination of magnesium, which is said to be quite accurate, is proposed by J. O. Handy as follows: A strong solution of ammonia is added to ten times its volume of the magnesium solution, the mixture cooled to 20°–25° C., and then precipitated with saturated solution of sodium-ammonium phosphate. When the reaction is complete the precipitate is collected, washed, dried at a temperature of 50°–60°, and dissolved in a measured excess of decinormal sulphuric acid; two drops of alcoholic solution of methyl orange (0.1 per cent.) are added, and the solution titrated with decinormal sodium hydroxide.—Journ. Amer. Chem. Soc., *22*, 31.

Anhydrous Magnesium Carbonate—Preparation and Properties.—According to R. Engel, practically pure anhydrous magnesium carbonate is obtained on heating the double carbonate of ammonium and magnesium —$(NH_4)_2CO_3MgCO_34H_2O$—in a current of dry air, gradually raising the temperature to between 130° and 140° C., the residual anhydrous magnesium carbonate retaining the original crystalline form of the double carbonate. It has a great affinity for water; when exposed to the air it becomes hydrated as quickly as lime under the same conditions; the amount of water thus combined is a little more than 1.5 molecules for each molecule of the neutral carbonate. It is soluble in water to the extent of 0.2 : 100, whereas the hydrated carbonate is only dissolved in the ratio of 0.1 : 100, and the natural anhydrous carbonate is insoluble in water. Mixed with a little water it sets like plaster, and when suspended in a large quantity it rapidly forms crystals of the composition $MgCO_33H_2O$. Exposed to gaseous ammonia it absorbs a little more than one molecule for each two molecules of magnesium carbonate. In all these properties it differs so markedly from the native magnesium carbonate that the difference can hardly be attributed to its physical condition. If, during the course of preparation, the temperature is allowed to rise between 160°–180° C., the salt undergoes decomposition, with the loss of CO_2, whereas the native carbonate may be heated to dull redness without decomposing.

The double carbonate of magnesium and ammonium is obtained by mixing solutions of magnesium bicarbonate and ammonium bicarbonate, both saturated with CO_2, and exposing the mixture to the air. The double sesquicarbonate, $MgCO_3NH_4HCO_24H_2O$, does not exist.—Pharm. Journ, Nov. 25, 1899, 493; from Comptes rend., 129, 598.

EARTHS.

Aluminum—New Method of Estimation.—Alfred Stock finds that when a mixture of potassium iodide and iodate acts upon a solution of an aluminum salt, aluminum hydrate is precipitated and the corresponding quantity of iodine is liberated, according to the equation $Al(SO_4)_3 + 5KI + KIO_3 + 3H_2O = 2Al(OH)_3 + 3H_2SO_4 + 6I$. This is a reaction which begins very rapidly in the cold, but which is not complete for several days, especially with dilute solutions; the velocity of the reaction can, however, be accelerated if the iodine liberated during the reaction is removed by means of sodium thiosulphate, or by allowing the precipitation to take place when hot. By working on a boiling water-bath, the reaction is complete in a few minutes, and by removing the iodine at the same time by means of standard thiosulphate solution, a method of estimating aluminum can be devised—the precipitation being total, even in dilute solution. —Chem. News, Feb. 16, 1900, 83; from Compt. rend., *130* (Jan. 22, 1900), No. 4.

Aluminum Iodide—Explosive Character.—P. L. Narasan records the explosion of a hermetically sealed glass tube containing aluminum iodide, being one of two similar tubes received at Madras from a German firm. Both tubes were at the time lying on the lecture-table after having been passed round the class for inspection. The temperature of the lecture-room at the time of the explosion was 95° F., and there was no reason to suppose that the volatile compound had formed an explosive mixture with air.—Pharm. Journ., Oct. 14, 357; from Nature, *60*, 520.

Magnalium—A Useful Alloy of Aluminum and Magnesium.—Prof. Jos. Klandy draws attention to "Magnalium," an alloy of pure aluminum and magnesium in variable proportions according to the intended use. Magnalium containing from 2 to 5 per cent. of magnesium is the most suitable material for drawing into wire; from 5 to 8 per cent. for rolling into sheets, from 8 to 20 per cent. (preferably 12 to 15 per cent.) for casting, 20 to 30 per cent. for the dividing circles of optical and other instruments, and over 30 per cent. for mirrors. The cast magnalium, which may be worked up in a great variety of ways, may be expected to be the material in greatest demand. It has a nearly silver white-color, and is capable of receiving a high polish. Experiments are in process to determine the effects of soldering. In place of magnesium some of the heavy metals, such as copper, nickel, tungsten, &c., may be used to form good alloys with aluminum.—Apoth. Ztg., Dec. 23, 1899, 777; from Oest. Chem. Ztg., 1899, 636.

Fuller's Earth – Quality Required for Dusting Powders and the Toilet. —"An ex-miner," who has practical acquaintance with the mining and preparation of fuller's earth from the Bedfordshire deposits, which provide the best earth obtainable, communicates an interesting paper on the subject in "Chemist and Druggist" (July 22, 1899, 132). He calls attention to its antiquity, since it is mentioned in the Book of Kings, as well as in Malachi, as "fuller's sope," while Pliny mentions it as being the principal detergent used in the washing of clothes. In fact, it was known and used long before the time of Romulus and Remus, and a pictorial representation of the fulling-process is still extant on an Egyptian tomb of the time of Osirtasen. Fuller's earth derives its name from the Latin *fullo*, a cleanser of cloth. When first got out it appears like lumps of clay, and in two colors — yellow and blue. The yellow is the best earth, contains less sand and grit, and is used chiefly in the north of England and Scotland amongst the woollen-manufacturers to absorb the grease from woollen cloths before finishing. The blue earth is generally sent to the United States for refining oils and lard. For either purpose it has to be powdered, which is done by the aid of powerful machinery of special construction. The impalpable powder which is used for toilet and nursery, however, is a by-product, so to speak, since it is the powder which settles from the dust-laden air, and which travels so slowly through the large chambers that it takes a long while for any great quantity of it to settle down. Hence, also, it is much more expensive than the ordinary fuller's earth in powder. Among other uses, its application in form of soap as as well as dusting-powder to the skin is constantly gaining in favor, and in its use in the arts, the consumption of fuller's earth is very evidently on the increase.

MANGANESE.

Manganese Selenide—Preparation and Characters.—Fonzes-Diacon has obtained manganese selenide, MnSe, in a crystalline condition, both by wet and dry processes. When H_2Se is passed to saturation through a solution of manganese acetate containing a little hydrochloric acid, and the solution is allowed to stand for some days, protected from the air, it deposits fine greyish-black, opaque crystals of MnSe. When a mixture of nitrogen in H_2Se is passed over dried $MnCl_2$ heated to redness, a black mass is obtained which contains in the interior minute gray prisms which are yellowish-gray by transmitted light. These crystals also have the constitution MnSe. Amorphous MnSe obtained by precipitation, when heated in the electric furnace fuses to a button with a metallic lustre, which has a markedly crystalline fracture and structure. In an atmosphere of oxygen it is converted entirely into manganese selenate; this salt when heated in a current of hydrogen is reduced, SeO_2 is sublimed and a greenish friable mass, manganese oxyselenide, is left, mixed with some black mass.—Pharm. Journ., June 9, 1900, 615: Compt. rend., *130*, 1023.

Manganese Fluoride—Preparation and Characters.—H. Moissan and Venturi have obtained manganese fluoride, MnF_2, in the form of a crystalline powder by the action of aqueous solution of hydrofluoric acid, or of the gas, on metallic manganese; by the decomposition of manganous fluorosilicate, and by the decomposition of manganous carbonate with aqueous hydrofluoric acid. When the acid is employed, a pale rose-colored solution of the hydrated fluoride is obtained; on heating this solution the anhydrous fluoride is precipitated in minute crystals. To obtain this in the form of well-formed larger crystals advantage is taken of the fact that it is soluble in anhydrous manganous chloride. A platinum crucible containing a mixture of manganous chloride and fluoride is placed in another porcelain crucible which in its turn is packed with charcoal in an earthen crucible. The whole is heated to redness so as to fuse the mixture and then allowed to cool slowly. The chloride is dissolved away with water and the crystals of manganous fluoride left are washed, first with dilute acetic acid and then with water. It forms handsome rose-tinted prisms, 1 Cm. long, having a density of 3.98, melting at 85° C. It is practically insoluble in water, in alcohol and in ether. It is slightly soluble in ammonia, forming a definite crystalline compound having the composition $3\ MnF_2)2NH_3$. Manganous fluoride is easily reduced by metals and metalloids, and readily combines with fluorine to form the sesquifluoride MnF_6.—Pharm. Journ., June 9, 1900, 615; from Compt. rend., *130*, 1158.

IRON.

Ferrum Redactum, B. P.—Comparison of Different Assay Methods.—During the discussion following the reading of E. Saville Peck's paper on Ferrum Redactum at the Brit. Pharm. Conference in 1898 (in Proceedings, 1899, 634), the question arose as to whether the results obtained with the methods of the B. P., 1898 (copper sulphate) and the U. S. P. (mercuric chloride) had been compared with the "iodine method," devised by E. Schmidt (see Proceedings, 1898, 940). On the basis of experiments since made, which are given in some detail in the present paper, *Conference in 1899*, Mr. Peck arrives at the following conclusions: That the "mercuric chloride" and the "iodine" methods give almost identical results, and fairly corroborate each other, but that the "copper sulphate" method invariably gives higher readings and is not satisfactory. While either of the other methods is therefore to be preferred, practical experience convinces the author that the "mercuric chloride" method is the most satisfactory.—Trans. Brit. Pharm. Conf., 1899, 377–380.

Ferric Acid—Question of Existence.—J. Knobloch has endeavored to prepare ferric acid, FeO_3, in the form of its salts, following the different processes that have been proposed, but has uniformly obtained negative results. He therefore not only regards the methods heretofore published

as being inadequate for its preparation, but questions the existence of the ferric acid compounds described in literature.—Pharm. Ztg., Nov. 1, 1899, 780.

Dr. M. Hoehnel, referring to the foregoing, brings evidence based upon his own experiments, which not alone proves the existence of ferric acid compounds, but that they are readily obtained by any of the published methods, even that of Stahl, who first called attention to ferric acid. The failure of Knobloch to obtain these salts he attributes to the heating of their solutions, which, when it exceeds 60 C., invariably decomposes them.—Ibid., Nov. 8, 1899, 799.

Potassium Ferrate—Preparation.—F. H. Alcock observes that the methods given in text-books for preparing potassium ferrate are so indefinite as to be of little use to the student and leading to much trouble if the endeavor is made to carry out the process. All this trouble could be obviated if the books would supply students with more manipulative pabulum, and this is now supplied by the author as follows: Weigh 5 Gm. of potassium hydroxide, powder it, and add thereto 0.10 Gm. solid ferric chloride (made by evaporation of about 1 cubic centimeter of liquor ferri perchloridi fortior, which will supply sufficient for many trials), mix well in the wedgewood mortar, when a peculiar salmon-pink color appears (quite different to the ferric oxide tint). As trituration proceeds, the mass absorbs water from the air and becomes damp. Now add, from a burette charged with bromine and contained in a fume chamber, or in a good draught, a sufficient quantity (slowly, because of the great heat which is generated and evolved with a hissing sound) of this element to form a creamy consistence (2 to 3 cubic centimeters); then continue the mixing until all the surplus bromine has volatilized. Then dissolve the peculiarly tinted mass (not unlike amorphous phosphorus) in cold distilled water, when the beautifully colored solution makes its appearance, and may be clarified by filtration through Swedish filter paper and its tinctorial power tested by allowing the liquid to drop into pure distilled water.—Pharm. Journ., May 5, 1900, 464.

COBALT.

Cobalt Nitrate—An Antidote for Prussic Acid.—According to a London correspondent of "American Practitioner," cobalt nitrate, after numerous experiments upon animals, has been found a successful antidote in 40 cases of poisoning by hydrocyanic acid.—Pharm. Post, Sept. 3, 1899, 491.

NICKEL.

Nickel Salts—Examination.—E. H. Gane points out the necessity for pharmacists to familiarize themselves with the methods of assaying nickel salts, which, owing to the increased use in the arts, are much in demand. The salt usually found in commerce is the double sulphate of ammonium

and nickel, $NiSO_4(NH_4)_2SO_46H_2O$, and the percentage of nickel can be accurately determined by Leison's oxalic acid process. Precipitation by ammonium sulphide is apt to give inaccurate results, owing to a portion of the precipitate redissolving in the polysulphides usually present in ammonium sulphide solution. The oxalic acid process is as follows: Dissolve the nickel sulphate in a small quantity of water, add excess of oxalic acid in solution, and concentrate on the water bath to about half the former volume. Then dilute with about twice the volume of alcohol, and digest for half an hour, adding alcohol to replace that evaporated. Collect the precipitated oxalate on a filter, wash and dissolve in ammonia water. Acidify with sulphuric acid, and titrate the liberated oxalic acid with permanganate solution. If the green color of the solution interfere with the end reaction, the addition of a solution of cobalt sulphate will decolorize the nickel solution. (The colors of cobalt and nickel are exactly complementary.) This ingenious device was first suggested by Sir Wm. Crookes. This process gives very accurate results, and is simple in operation.—Amer. Drugg., Jan. 10, 1900, 4.

ZINC.

Zinc—Volumetric Estimation.—Pouget proposes a volumetric method for estimating zinc which depends upon the precipitation of zinc as sulphide, decomposition of the sulphide with iodine solution and titration of the excess of iodine with thiosulphate. The process is carried out as follows: To the zinc solution 20 Cc. of 10 per cent. sodium acetate solution is added for each 0.1 Gm. of Zn supposed to be present; ammonia is added, drop by drop, until a permanent precipitate is formed, and then an excess of a saturated solution of H_2S. The liquid is boiled until the last trace of H_2S is driven off: it is cooled, a measured excess of standard iodine solution is added, and after standing to allow the complete decomposition of the ZnS, the excess of iodine is determined with thiosulphate in the usual manner.—Pharm. Journ., Sept. 9, 1899, 235; from Compt. rend, *129*, 45.

Calamine—A Spurious Article.—E. H. Gane calls attention to a spurious article which is largely sold for calamine. Examination shows that zinc is totally absent, and that it is composed wholly of barium sulphate colored with iron oxide.—Amer. Drugg., Jan. 10, 1900, 4.

Zinc Chloride—Prevention of Turbidity on Diluting its Solutions.—It is well known that on the dilution of concentrated zinc chloride solution turbidity is produced. This turbidity is due to the separation of basic zinc chloride, which is redissolved on the addition of a very little hydrochloric acid, a practice which, though unauthorized, is often followed by dispensers. Paul Wiskirchen, however, finds that the addition of acid is unnecessary. He finds that if it is attempted to dissolve pure zinc chloride in *cold* water, or if cold water is added to a clear solution of zinc chloride,

turbidity is invariably produced, but if the solution is effected with *hot* water, or if the dilution is made with hot water, clear solutions result, and so remain permanently.—Pharm. Centralh., Aug. 17, 1899, 508.

COPPER.

Copper—Solubility in Gelatin Solution.—A. Lidof finds that when a spiral of bright metallic copper is suspended in an alkaline solution of gelatin, the liquid acquires a violet tint in twenty-four hours and becomes darker in a longer period, the copper rapidly losing weight, equivalent to 3.4 per cent. in forty-seven days. When the violet solution thus obtained is heated under pressure, or when it is treated at the ordinary temperature with formaldehyde, it is decomposed, a precipitate composed of copper with organic bodies being thrown down. The author attributes the so-called "biuret" reaction to the formation of this soluble organic copper compound.—Pharm. Journ., March 10, 1900, 249; from Bull. Soc. Chim., *24*, 33.

Copper, Zinc and Tin — Electrolytic Determination in Preserves. — Dr. Hilger and L. Laband find that in order to determine copper, zinc or tin in preserves, the organic substance must first be destroyed. This is best accomplished, as proposed by Halenke, by heating the substance with sulphuric acid, similarly to the method followed in Kjedahl's process of combustion. The electrolytic separation of *copper* is then an easy matter. In the case of copper the destruction of the organic matter may also be advantageously accomplished by means of nitric acid of 25 per cent. In the case of *zinc* the electrolytic separation of the metal is best accomplished in an alkaline medium, the authors finding that the separation takes place very satisfactorily in alkaline solutions of zinc phosphate when a current of 0.2–0.5 ampères and 4 volts is employed. The separation of *tin* may be most rapidly accomplished from its solution in ammonium sulphide. The tin is precipitated from the solution of the substance, destroyed as above mentioned, by means of H_2S, ammonium sulphide is added, and the filtered solution subjected to direct electrolysis. — Apoth. Ztg., Sept. 27, 1899, 575.

Cupric and Cuprous Phosphides—Formation.—According to E. Rubénovitch, cupric phosphide, Cu_3P_2, is formed by the action of PH_3 on cupric oxide, on cupric hydrate, or on basic cupric carbonate. In each case the action is very energetic, much heat being generated, and with the two last-named even incandescence taking place unless the copper compound be suspended in water. Phosphoric acid is formed at the same time. The cupric phosphideo btained, when washed and dried without contact with the air, is a grayish-black amorphous body, very soluble in nitric acid and in bromine water, and attacked by hot concentrated sulphuric acid with liberation of sulphur and sulphurous acid. Cuprous phosphide, Cu_2P_2, is obtained by passing a current of PH_3 and CO_2 over

cuprous oxide.—Pharm. Journ., Sept. 16, 1899, 275; from Compt. rend., *129*, 336.

Copper Hypophosphite—Preparation and Characters.—According to R. Engel, cupric hypophosphite, $Cu(H_2PO_2)_2$, is obtained by precipitating a solution of cupric sulphate with an excess of solution of barium hypophosphite, forming, when dried over sulphuric acid, a white, shining, crystalline salt. Its dilute solution may be boiled without decomposition. The dry salt is violently explosive when heated to 90° C., hydrogen phosphide being formed.—Apoth. Ztg., Dec. 13, 1899, 750; from Chem. Ztg., 1899, *23*, 885.

TUNGSTEN.

Tungsten Chlorobromides—Formation and Characters.—Ed. Defaçoz finds that it is not possible to prepare hexabromide of tungsten by the action of liquid hydrobromic acid on the hexachloride in sealed tubes kept at a temperature of 70° C., but he has prepared two chlorobromides: one, the more stable of the two, is formed at about 70°, and is the hexachlorotrihexabromide, $WCl_6.3WBr_6$; the other is obtained at a temperature of 15° C., and is the hexa-chlorobromide, WCl_6WBr_6. These two compounds are the first known chlorobromides of tungsten. The former substance is green, and composed of a mass of small crystals which melt at 232° C.; on exposure to air, it rapidly alters, turning brown in color.—Chem. News, Oct. 20, 1899, 195; from Compt. rend., *129* (Oct. 2, 1899), No. 14.

MOLYBDENUM.

Molybdenum Silicide—Properties.—E. Vigontoux finds that molybdenum, prepared by Moissan's method in the electric furnace, will unite almost directly with silicon. The product has a composition analogous to that of tungsten silicide, and almost identically the same properties. It burns with incandescence in chlorine at about 300° C., with formation of silcon tetrachloride and black molybdenum perchloride.—Chem. News, Jan. 12, 1900, 22; from Compt. rend., *129* (Dec. 26, 1899), No. 26.

Molybdenum Bisulphide has been obtained by Marcel Guichard, after several trials, in two forms, the one crystalline, the other amorphous. The methods, which are described in detail in "Compt. rend." (xxi. (1899) No. 26), yield these products in tolerably large quantities, no previous method having permitted this.—Chem. News, Jan. 12, 1900, 22.

Molybdenum Dioxide — Formation by Two Distinct Methods.—Marcel Guichard has obtained molybdenum dioxide, MoO_2 by two distinct methods—the one, by the action of molybdic anhydride on ammonium molybdate; the other, by the electrolysis of fused molybdic anhydride. In both cases the oxide obtained was pure and crystallized, analysis showing it to have the formula MoO_2. The author's research also shows that another hydrous oxide of molybdenum, intermediate between MoO_2 and MoO_3, is

not known, except that which results from the dehydration of the blue hydrated oxide, provided that this dehydration can be effected without peroxidation. — Chem. News, Dec. 1, 1899, 261 ; from Compt. rend., *129* (1899), No. 19.

VANADIUM.

Vanadium—Cosmic Distribution.—Numerous investigations conducted by B. Hasselberg lead to the interesting observation that vanadium is distributed, in small quantities it is true, over the entire globe. Moreover, it is found in small meteorites, but not even a trace was found in the larger ones, with the single exception of the iron meteorites found in Greenland, which leads to the conclusion that the two kinds are of different origin. The determinations were mostly made spectroscopically.—Apoth. Ztg., Dec. 13, 1899, 750 ; from Chem. Ztg., 1899, *23*, 298.

Vanadic Acid and Sodium Vanadate are recommended by various French authors as being valuable medicaments for the treatment of tuberculosis and various forms of rheumatism. The acid is given in daily doses of 0.00045 Gm., in two portions and very diluted. The sodium salt is given in doses of 0.001 to 0.002 Gm. night and morning.—Pharm. Ztg., Sept. 13, 1899, 648.

Sodium Metavanadate—Preparation of an Active Salt.—In order to obtain sodium metavanadate in the most active form, the following details for its preparation must, according to Pécourt, be strictly observed : Pure vanadic acid, obtained by calcining ammonium vanadate, is dissolved in excess of caustic soda ; then, while boiling, the excess of alkali is neutralized with acetic acid, and the boiling continued until the liquid is concentrated as far as possible, without the separation of crystals. It is then precipitated with strong alcohol, which removes the greater part of the sodium acetate. The yellow precipitate is re-dissolved in boiling water, and reprecipitated with alcohol, until free from acetate. This should be effected rapidly, since prolonged boiling with alcohol materially reduces the vanadate. With regard to lithium vanadate, which has been recommended, the author remarks that the salt must necessarily be administered in such infinitesimal quantities, that the amount of the metal absorbed could have no notable effect. He also expresses doubt as to the existence of true vanadates of the alkaloids, in view of the extreme instability of vanadic acid in the presence of organic matter. For this reason too, the acid or its salts should not be prescribed with sugar, syrups, or wines. Organic matter of any kind should be avoided.—Pharm. Journ., Nov. 25, 1899, 493 ; from Repertoire [3], *11*, 487.

ARSENIC.

Arsenic — Estimation of Very Small Quantities.—Armand Gautier recommends a method for the estimation of very small quantities of

arsenic, in which the action from beginning to end takes place in the midst of strongly oxidizing agents, and the whole of the chlorides are destroyed almost at the beginning, these latter being one of the principal causes of the loss of arsenic in the form of volatile compounds. The method consists in destroying the organic matter successively by nitric acid and sulphuric acid, then again by nitric acid.—Chem. News, Dec. 29, 1899, 315; from Compt. rend., *129* (Dec. 4, 1899) No. 23.

Arsenic — Liability to be Overlooked in Ordinary Testing. — Dr. B. H. Paul and A. J. Cownley call attention to the liability of overlooking arsenic in applying the tests for its presence commonly in use, particularly in the instance of substances that are supposed to contain only mere traces of the poisonous body. Among the methods of detecting small quantities of arsenic, those known as Reinsch's and Marsh's test will give satisfactory indications with skillful manipulation, and when suitably applied; but much depends upon those conditions and the exercise of discrimination by the operator. Bettendorf's test is relied on by the Germ. Pharm. to indicate practical freedom from arsenic; but the conditions there directed to be observed to obtain an indication of practical absence of arsenic in such a substance as glycerin or sodium phosphate, for instance, are not given in the B. P. Of the different tests, the authors regard Gutzeit's test, as modified by Siebold, and described under the head of glycerin in the B. P., as being very much more delicate than any other. It is true, this test is at present open to some suspicion as regards its positive indications, since hydrogen sulphide or hydrogen phosphide might produce the same kind of yellow stain upon the mercurial paper as hydrogen arsenide. But, however much such positive indications may be open to question as proof of the presence of arsenic in minute proportions, a negative result with that may very safely be taken as evidence that the article tested is practically free from arsenic. — Pharm. Journ., June 30, 1900, 688.

Arsenides—Formation of Several New Compounds.—P. Lebeau has succeeded to obtain the compounds As_2Sr_3, As_2Ba_3 and As_2Li_3, by heating mixtures of the corresponding arsenates with charcoal in the electric furnace.

Strontium Arsenide resembles calcium arsenide closely, being reddish-brown and of a micro-crystalline structure and closely agreeing in chemical reactions. It is decomposed by water into hydrogen arsenide and strontium hydrate, reduces most metallic oxides, and is acted on with much energy by reducing agents.

Barium Arsenide has similar properties, but is more energetic in its action.

Lithium Arsenide occurs as a deep brown substance, with a crystalline fracture, and has chemical reactions similar to those of the arsenides pre-

viously named.—Pharm. Journ., Sept. 9, 1899, 235; from Compt. rend., *129*, 47.

Potassium Arsenate—Stability and Advantages over Sodium Arsenate.—John Lothian calls attention to the fact that of the three potassium salts of ortharsenic acid, K_3AsO_4, K_2HAsO_4, and KH_2AsO_4, the latter, or mono-potassium arsenate, is the only stable one. It is most readily prepared by fusing at a low red heat in a porcelain crucible a mixture of equal parts of dry potassium nitrate and arsenous anhydride, when cold dissolving the fused mass in water, evaporating and setting aside to crystallize. The salt crystallizes out in dimetric octohedra, forming anhydrous crystals which are permanent in the air, have an acid reaction, are soluble in about 5 parts of water and almost insoluble in 90 per cent. alcohol. They contain 63.8 per cent. As_2O_5. This constitutes the salt of commerce, which he has found to agree with his own product in every respect.

When arsenic acid is neutralized by potassium bicarbonate the salt K_2HAsO_4 exists in solution. On evaporation, however, crystals of mono-potassium arsenate, KH_2AsO_4, are deposited, and as the crystallization proceeds the mother liquor becomes very alkaline. This is explained by the hydrolysis of the K_2HAsO_4 in solution. On evaporation the equilibrium is upset by the greater stability of the dissociated molecule of KH_2ASO_4, which, although an acid salt, crystallizes out in the presence of alkali. In the case of

Sodium Arsenate, the greater stability rests with the compound Na_2HAsO_4, which is formed when arsenic acid is neutralized by sodium bicarbonate. Hence in the hydrolyzed solution the alkaline compound Na_2HAsO_4 is re-formed, and crystallizes out on evaporation in combination with 7 or 12 mol. of H_2O. The author considers the hydrolysis of the sodium arsenate the correct explanation of the disposition of strychnine in the mixture of liquor sodii arsenatis and liquor strychninæ hydrochlor. discussed in the recent papers of Dunlop and Hill (see *Liquor Sodii Arsenatis*, under "Pharmacy"). The products of the hydrolysis here are explained by the following equation: $Na_2HAsO_4 + H_2O = NaH_2AsO_4 + NaOH$. The latter is neutralized by the hydrochloric acid of the strychnine hydrochloride; the strychnine is precipitated, and the acid salt NaH_2AsO_4 remains in solution together with the NaCl formed. Experiments made by the author prove this conclusively.—Pharm. Journ., Feb. 24, 1900, 183.

Sodium Arsenate—Incompatibility with Strychnine Salts.—See *Solution of Sodium Arsenate, B. P.*, under "Pharmacy."

Iron Arsenate—Variable Composition.—Thos. S. Barrie calls attention to the variable composition of iron arsenate, which he finds is never twice the same, while the corresponding compounds of sodium and of potassium are obtainable of uniform composition. The B. P. directs its preparation

by the interaction of ferrous sulphate and sodium arsenate in the presence of sodium bicarbonate, the latter being necessary to neutralize the sulphuric acid liberated during the reaction. The product when first formed is white, but absorbs oxygen with astonishing rapidity, becoming green and ultimately brown. The B. P. determines the correctness of the composition of this salt by the percentage of iron it contains. This the author regards a mistake, since, in view of the small percentage of iron in the compound, and the smallness of the dose of the compound itself, the medicinal activity of the salt must be referred to the arsenic oxide, that of the iron being quite negligible. He finds a modification of Joulic's process, as described in "Sutton's Analysis," to be the most reliable one tried for the estimation of arsenous oxide. This is carried out as follows: 1 Gm. of iron arsenate dissolved in a little nitric acid sufficient to thoroughly peroxidize is treated with a solution of 5 Gm. citric acid, containing 1 Gm. magnesium carbonate, and 30 Cc. strong ammonia; total volume not exceeding 100 Cc. After twelve hours the crystals are collected, washed, and dissolved in dilute hydrochloric acid, which is first made slightly alkaline with ammonia-water, and then acidulated with acetic acid. The solution so obtained is made up to 200 Cc. and titrated in the usual way. The author has determined the arsenic oxide and the iron as ferrous oxide, in four commercial samples, to be as follows:

Sample.	Percentage of As_2O_5	Percentage of FeO.
1	34.2	3.95
2	42.7	4.45
3	45.05	4.1
4	39.36	5.04

From these results two deductions can be made—first, that commercial arsenate of iron is of variable composition; and second, that the percentage of ferrous oxide is no indication of the percentage of arsenic anhyin the dried sample.—Chem. and Drugg., May 26, 1900, 484.

ANTIMONY.

Antimony Preparations—Modification of B. P. Process of Assay.—Reference has frequently been made to the necessity of operating quickly when assaying the antimony preparations of the B. P. by the official volumetric process, the necessity for celerity being due to the liability of the antimony solution obtained by the process to precipitate a portion of the antimony in the form of $Sb(OH)_3$, before titration is completed. F. H. Alcock, after suitable experiments, confidently recommends the following modification, which is free from the objection mentioned: Weigh 1 Gm. of *tartar emetic*, add 50 Cc. of water and 10 Gm. of Rochelle Salt, and,

after solution, add two, three or more Gm. (an excess) of sodium bicarbonate, and make up the whole to a suitable volume. Of this solution an aliquot part, say 20 Cc., is titrated with iodine solution according to the official directions. *If solution of antimony chloride* is to be assayed, the solution may be made with 5 Cc. of the antimony solution, using the other ingredients in the same quantities and proportions; or, if it be *antimony oxide*, 1 Gm. of this is converted into tartar emetic by the aid of 2 Gm. of cream of tartar, 10 Gm. of Rochelle Salt are added, followed by an excess of soda, and water is added, in this case, to make 200 Cc. instead of 100 Cc. of solution, which is then titrated as in previous cases. The solutions obtained under these directions have been kept for several months without evidencing any deposition of antimony, the titre being the same after keeping as when freshly prepared.—Pharm. Journ., April 7, 1900, 362.

Antimony Sulphide—Reduction by Hydrogen.—H. Pélabou states that, when crystallized antimony sulphide is treated with hydrogen at above 360° C., it is reduced to metallic antimony, and hydrogen sulphide is formed. Reciprocally, hydrogen sulphide attacks metallic antimony, forming the trisulphide, Sb_2S_3. If the operations take place in sealed tubes, the two inverse reactions tend to a system of four bodies in chemical equilibrium, the limiting composition of the gaseous mixtures depending only on the temperature.—Chem. News, April 27, 1900, 202; from Compt. rend., *130* (April 2, 1900), No. 14.

Double Fluorides of Antimony—Possible Adulterants of Tartar Emetic.—L. F. Kebler observes that within the last few years several double fluorides of antimony, potassium, sodium, ammonium, etc., have been placed upon the market. These fluorides are readily soluble in water, and the antimony in the potassium compound can be so adjusted as to approximate the amount of antimony in tartar emetic. This may, therefore, become a dangerous adulterant for tartar emetic, not detectable by the U. S. P. requirements; but the hydrofluoric test will reveal its presence.—Proc. Penna. Pharm. Assoc., 1899, 118.

BISMUTH.

Bismuth—Determination in Organic Salts.—The proposition of Duyk to precipitate the bismuth in the form of oxalate has been applied by Dietze to several organic bismuth salts. 1 Gm. of the salt is heated to boiling with 0.4 Gm. of oxalic acid and 50 Cc. of water, the boiling being continued for five minutes; it is then filtered through a tared filter, washed, dried, and weighed. Bismuth oxalate contains, according to Duyk, 72.06 per cent. Bi_2O_3; according to Dietze, 74.12 per cent. The results obtained by the latter were:—

Bismuth benzoate ("about 40 per cent.")	43.49 to 43.53.
Bismuth salicylate ("about 40 per cent.")	39.59 to 39.81.
Bismuth subgallate ("about 55 per cent.")	58.12 to 58.24.
Bismuth subsalicylicum, Ph. G. III	62.82 to 62.99.
Bismuth tannate ("about 40 per cent.")	41.99 to 42.37.
Bismuth valerianate ("about 73–75 per cent.")	77.86 to 78.12.
Dermatol	48.17 to 48.25.

—Pharm. Centralh., 1900, 280.

Bismuth Sub-Carbonate—Detection of Nitric Acid.—Having observed the reddening of a mixture containing bismuth subnitrate and potassium iodide, F. H. Alcock substituted the sub-carbonate for the subnitrate in several experiments. Here he found that, while the red color was not developed, a faint yellow color did appear, though never more than a pale straw color. This was found to be dependent upon a variable amount of the nitric radicle present, and the author thinks the reaction might be utilized for the detection of this impurity.—Pharm. Journ., June 16, 1900, 640.

Bismuth Oxysalts—Production in Definite Crystalline Form.—A. de Schulten obtains the bismuth oxysalts BiOCl and BiOBr in definite crystalline form by heating the amorphous precipitate of the oxychloride or oxybromide of bismuth with a large volume of water in the presence of an excess of hydrochloric or hydrobromic acids. Both of these salts are thus obtained in clear, colorless, quadratic crystals. The oxyiodide BiOI, on the other hand, forms clear copper-colored crystals. It crystallizes as the temperature rises, when bismuth oxide is dissolved in excess of hydriodic acid, then diluted with a large volume of water and warmed on the water-bath; but, if a considerable excess of acid be not present, black crystals of bismuthous iodide will be formed.—Pharm. Journ., April 7, 1900, 357; from Bull. Soc. Chim., *23*, 156.

MERCURY.

Mercury—Australia Probably a Rich Source of Supply.—Although the occurrence of mercury in New South Wales has been known since 1841, recent discoveries near Yulgilbar, in the Clarence river district, point out that the quicksilver trade will probably be completely revolutionized, since the ores prove to be particularly rich, the poorest assays showing them to be far richer than the ores of the American and Spanish mines, while their area is believed to be very extensive.—Pharm. Journ., Nov. 4, 1899, 422.

Calomel—Conversion into Corrosive Sublimate.—Olive St. Clair Lewis records the results of a series of experiments undertaken with the view of throwing some further light on the subject of the convertibility of calomel into corrosive sublimate under certain conditions when taken into the stomach. Having repeated some of the experiments made by E. L. Ozias in 1897 (see Proceedings 1898, 951) and of O. H. Tansey, the investi-

gator inclines to the opinion that calomel is converted into corrosive sublimate by the action of the acid juices of the stomach.—Proc. Kansas Pharm. Assoc., 1899, 42–46.

Mercury Chlorosulphide—Formation.—According to F. Bordroux, when a dilute aqueous solution of mercuric chloride is precipitated with a solution of calcium polysulphide the resultant white precipitate is not a polysulphide of mercury, but a chlorosulphide having the constitution $Hg_2S_5HgCl_2$. It is very stable at ordinary temperature, but is slowly decomposed by light.—Pharm. Journ., June 30, 1900, 687; from Compt. rend, *130*, 1393.

Yellow or Green Mercurous Iodide—Question of Preference.—J. F. Hancock discusses the question of the relative advantage of the yellow and green mercurous iodides, the one over the other, both being prescribed and dispensed. The yellow compound is the one now official in the U. S. P., a formula being given for its preparation which depends on the interaction of mercurous nitrate and potassium iodide on each other under specific conditions. The green compound is the mercurous iodide of the U. S. P., 1880, which was obtained by the direct action of mercury and iodine upon each other in the presence of alcohol. All investigations seem to point out that the green color of the latter compound is due to the presence of varying proportions of free mercury, and that the yellow amorphous compound now official, and prepared and preserved under the provision of the Pharmacopœial directions, is the preferable salt. On examining specimens in various pharmacies, however, the author found many shades of color in the same size vials, and from the same manufacturer. Most of the specimens examined did not answer to the description of the U. S. P., 1890, and he infers from this that much of the mercurous iodide in the pharmacies has been made according to the formula of former Pharmacopœias, and very unsatisfactory in character. — Proc. Maryland Pharm. Assoc., 1899, 63–66.

Mercurous Nitrite—Reaction with Ethyl Iodide. — Dr. P. C. Ray finds that when mercurous nitrite acts upon ethyl iodide, about equal quantities of nitroethane and its isomeride, ethyl nitrite, are formed. If the residue in the flask after the interaction of the two substance is heated in a tube,

Mercurous Iodide sublimes off between 190° and 210° C. The compact mass of crystalline leaflets thus obtained shows all gradations of tint from lemon and orange yellow to dark brown.—Proc. Chem. Soc. *15*, 239.

RUTHENIUM.

Ruthenium and Potassium Nitrite—A New Double Salt.—L. Brizard has obtained a new double nitrite of ruthenium and potassium, differing from the two already known in properties and constitution. Analysis shows the formula to be $Ru_2H_2(NO_2)_4.3NO_2K.4H_2O$. The action of

hydrochloric acid on this salt transforms it into the complex double chloride, which was the starting-point for the original preparation of the nitrite. The reaction, very slow in the cold, but becoming more rapid on boiling, may be represented by the equation—$Ru_2H_2(NO_2)_4.3NO_2K + 8HCl = Ru_2H_2NO.Cl_3.3KCl.2HCl + 2NO + 4NO_2 + 3H_2O$.—Chem. News, Aug. 25, 1899, 95; from Compt. rend., *129* (July 24, 1899), No. 4.

SILVER.

Silver—Action of Hydrogen Sulphide and of Hydrogen on Silver Sulphide.—It is known that silver sulphide can be reduced by hydrogen and that, inversely, hydrogen sulphide attacks silver. H. Pélabou has studied the two inverse reactions for very wide variations of temperatures, and gives the details of his experiments and results, which are summarized as follows: 1. Below 180° C. silver is not attacked by dry hydrogen sulphide. Neither is silver sulphide reduced by hydrogen. 2. Above 280° the two reactions take place with a speed so much the greater as the temperature is higher, but they are limited. The two limits led to the same value of temperature and the same composition of the gaseous system. This composition limit varies very little with the temperature; the gaseous mixture obtained is the richer in hydrogen sulphide as the temperature is lower. 3. The silver set at liberty by the reduction of the sulphide is filiform when the operation takes place at a temperature below 580°. At higher temperatures, the silver formed covers the surface of the sulphide uniformly. What takes place between 180° and 200°, remains to be examined. The experiments were conducted as follows: Sealed tubes containing hydrogen sulphide and silver, or hydrogen and silver sulphide are kept for a sufficiently long time at a definite temperature. At the end of this time they are quickly withdrawn from the furnace, and cooled rapidly by whirling in the air at the end of an iron wire to which they are attached. The analysis of the gaseous mixture contained in the tubes thus cooled gives the proportion of hydrogen sulphide they contain at the temperature of the experiment.—Chem. News, July 21, 1899, 25; from Bull. Soc. Chem., (3) *21*, No. 9.

Argentum Colloidale—Unofficial Description of the Dresden Apothecaries' Association.—Colloidal silver occurs in black-green, metallic glistening, heavy grains, which, when triturated with water, yield a greenish-black solution, appearing red-brown when largely diluted. If

Solutio Argenti Colloidalis Albuminata is prescribed, 1 part of fresh egg white (corresponding to 0.15 part dry albumen), previously dissolved in water, is to be used for each 1 part of the colloidal silver required.—Apoth. Ztg., April 4, 1900, 225.

Silver Chloride—Reduction by Hydrogen.—It has been shown by Boussingault, and confirmed by Berthelot, that silver is attacked by dry hydro-

chloric acid. Jouniaux now finds that, reciprocally, silver chloride is reduced when heated in an atmosphere of hydrogen. The author has also studied the effect of temperature on these two inverse reactions.—Chem. News, Dec. 22, 1899, 304; from Compt. rend., *129* (Nov. 27, 1899), No. 22.

Silver—Double Salts with Copper.—An interesting series of double salts of silver and copper has been obtained by P. Sabatier by the interaction of solution of silver salts with blue cupric hydrate. The compound $3Cu(OH)_2,2AgNo_3$ is obtained in blue-violet crystals from normal solutions of silver nitrate; from hot concentrated solutions another dicupric salt, $2Cu(OH)_2,2AgNO_3$, separates in bright blue acicular needles. With solutions of silver chlorate and blue cupric hydrate a heavy blue precipitate is obtained, consisting of well-formed microscopic prismatic scales having the composition $2Cu(OH)_2,2AgClO_3$. A sulphate of analogous composition, $3Cu(OH)_2,Ag_2SO_4$, is obtained as micro-crystalline inclined prisms; another form in needles, containing 3 molecules of water, also exists. With silver thiosulphate blue cupric hydrate forms the salt $2Cu(OH)_2,Ag_2S_2O_6$ as a violet flocculent precipitate. Most of these compounds may also be obtained by the action of silver oxide in solutions of the various cupric salts.—Pharm. Journ., Aug. 26, 1899, 199; from Compt. rend., 129, 211.

GOLD.

Gold—Determination with Hydric Peroxide.—According to Vanino and Seeman, a solution of auric chloride when warmed with an alkaline solution of hydrogen peroxide is immediately reduced to metallic gold, whereas the reduction is not produced completely until after some hours when either ferrous sulphate or oxalic acid are used for the determination of gold. It is even better than formic aldehyde. The gold can also be separated in this way from platinum and iridium, which are not precipitated by alkaline hydrogen peroxide.—Pharm. Journ., Sept. 2, 1899, 219; from Berichte, *32*, 1968.

IRIDIUM.

Iridium—New Method of Purification.—Instead of using the old dry method for the purification of iridium, E. Leidie suggests a method founded on the conversion of the metal into chloride and then treatment with sodium nitrite. The iron and lead are first precipitated as oxides, the gold in the form of the metal itself. There remain then double nitrites of ruthenium, rhodium and iridium, and sodium osmiate. The ruthenium and osmium can be eliminated as volatile peroxides, whilst the rhodium and iridium are converted into the double chlorides with sodium chloride, in which compound the two metals are easily separated. The author proposes to generalize this method to the purification of all the

metals of the platinum group.—Chem. News, Aug. 25, 1899, 95; from Compt. rend., *129* (July 24, 1899), No. 4, *214*.

ORGANIC CHEMISTRY.

HYDROCARBONS.

(Including Volatile Oils and Resins.)

Acetylene—Generation and Purification on a Small Scale.—According to a communication from the Havemeyer Laboratories, Columbia University, the generation of acetylene on a small scale is conveniently conducted as follows: The carbide, preferably contained in a wide bucket or a wide-mouthed bottle, is covered with 95 per cent. alcohol. Slow generation at once begins, and enough gas is produced to expel all air present. Water now being added drop by drop, a gradual generation of acetylene occurs without material rise in temperature. Where economy is desirable the alcohol can be distilled off and collected again. As to purification, the account states that no single one of the many published methods is sufficient, and a combination of some of them is recommended. The gas produced as above is passed through an aqueous solution of 15.6 per cent. cupric sulphite, to which has been added 5 per cent. of 20 per cent. volume sulphuric acid, the mixture absorbing the alcohol, ammonia and hydrogen sulphide and phosphide. The gas may be further passed through one or two columns of pumice stone, saturated with an acetic or sulphuric acid solution. A small amount of these purifying minerals serves for a large quantity of gas. When properly carried out, the product is dry powder, and in lieu of the well-known nauseous odor possesses a faint and agreeable smell.—Pharm. Journ., June 13, 1900, 646; from Journ. Am. Chem. Society.

Acetylene—Purification.—T. Wolff finds that the average composition of acetylene obtained by means of carbide of American manufacture is 99.87 per cent. acetylene, 0.04 per cent. hydrogen phosphide, 0.02 per cent. hydrogen sulphide, and 0.06 ammonia; Swiss carbide yielding acetylene free from hydrogen sulphide, but otherwise of the same composition, while carbides of recent manufacture are constantly being improved, so that a judicious choice of materials enables the reduction of the amount of ammonia and of the hydrogen compounds to a few hundredths per cent. But even these small quantities are objectionable. For the purification of acetylene, the method of Frank, consisting in the use of acid solutions of certain metallic salts, particularly of copper chloride, gives good results, the only drawback being that a small portion of the

acetylene is converted into aldehyde. Mr. Wolff proposes the use of chloride of lime, containing a small quantity of an alkali chromate for the absorption of the free chlorine. The decomposition of acetylene is thus prevented completely. Chem. News, July 28, 1899, 40; from Jour. f Gasbeleucht., *42*, 683.

Acetylene — Action on Copper. — According to H. Alexander, acetylene has no action in the cold on pure precipitated copper; but when the temperature is kept at about 240° to 250° C., the gas is absorbed with the formation of small quantities of a greenish liquid, having the smell of a hydrocarbide, and a solid body of bright brown color, similar to cork in appearance, which gradually fills and finally obtrudes from the back end of the tube. No trace of acetylene has been obtained from this substance, which is not soluble in any reagent. When heated in air, it gives off yellowish fumes, smelling of Stockholm tar, and then takes fire and burns with brilliant incandescence. It contains about 2 per cent. of copper, which, however, can be eliminated by means of hydrochloric acid and ferric chloride, without any alteration in the properties of the substance. Further experiments are necessary to determine the constitution of this body. Provisionally the author recognizes that the copper plays the *rôle* of contact agent, and effects the molecular condensation of the acetylene in the form of this hydrocarbide resembling cork. The hydrogen resulting from this condensation does not escape in the free state, but helps in the formation of the liquid smelling of petroleum, which has been mentioned above.— Chem. News, June 15, 1900, 287; from Berichte, xxxii., p. 2381.

Acetylenetetrabromide—Use for the Separation of Mineral and Vegetable Mixtures.—The symmetric compound, acetylenetetrabromide, $C_2H_2Br_4$, is recommended by M. Muthmann on account of its high specific gravity as a separating fluid for mineral mixtures. It is a colorless fluid, which does not congeal at — 20° C. and boils at 137° C. It has the specific gravity of 3.0011 and is insoluble in water, but soluble in ether, with which liquids of any desired specific gravity within the limits of their respective densities may be produced. This renders it also very useful for the separation of ligneous matter and starch grains in plant powders, possessing the advantage over watery separating fluids in that the vegetable substance does not swell when in contact with it.—Pharm. Ztg., Feb. 28, 1900, 165; from Merck's Annual Report for 1899.

Cuprene—A New Hydrocarbon.—Paul Sabatier and Senderens describe a new hydrocarbon, to which they assign the empirical formula C_7H_8, and which they have named cuprene. It is stated to be obtained by passing a current of pure acetylene gas over reduced copper or bright copper filings in a tube heated at first to about 180° C. After a time the metal is observed to swell, and eventually to entirely fill the tube; if a little of this substance be spread in a thin layer in a tube and again heated

to 170°–250° C, in a current of acetylene, a further great increase in volume takes place, a yellow bulky solid is formed, consisting of matted filaments, resembling amadou in appearance. This is the new hydrocarbon. It is practically non-volatile, decomposing above 400° C., and yielding empyreumatic products and a solid carbonaceous residue. Cuprene is insoluble in all solvents; sulphuric acid is without action on it, but nitric acid slowly attacks it, forming nitro-compounds.—Pharm. Journ., March 3, 1900, 225; from Compt. rend., *130*, 250.

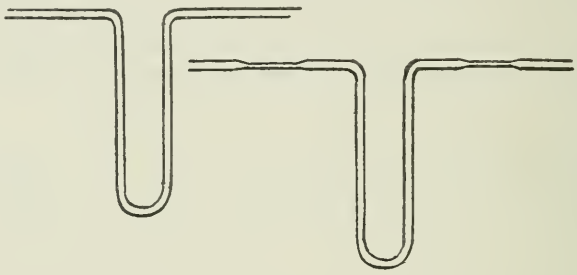
Petroleum—Deodorization.—According to "Revue Scientif.," petroleum may be deodorized by shaking it first with 100 Gm. of chlorinated lime for every 4.5 liters, adding a little hydrochloric acid, then transferring the liquid to a vessel containing lime, and again shaking until all the chlorine is removed. After standing, the petroleum may be decanted.—Pharm. Journ., Dec. 2, 1899, 529; from L'Union Pharm., 40, 413.

Paraffinum Liquidum—Necessity of Modifying B. P. Requirement of Specific Gravity.—E. W. Lucas points out, as has been already done by other writers, that the B. P. requirement of a sp. gr. of 0.885 to 0.890 for liquid paraffin is much too high. The process of refining reduces the density so that it is difficult to obtain it of higher gravity than 0.880. The author has examined products from several large refineries, and finds the sp. gr. varies from 0.865 to 0.879. From a medical point of view, 0.865–0.870 is quite viscous enough for use in a spray-apparatus. As a matter of fact, the proprietary article which enjoys the greatest reputation rarely exceeds 0.866.—Chem. & Drugg., Dec. 9, 1899, 959.

Volatile Oils—Modern Methods for their Physical and Chemical Examination.—Edwin Dowzard observes that during the past few years the knowledge of the physical properties and chemical constituents of volatile oils has advanced by leaps and bounds, so that it is now possible, in the majority of cases, to detect sophistications without the necessity of great research or labor; in fact, with the necessary appliances at hand it is possible to give an opinion as to the purity or otherwise of a volatile oil in an hour. In the present paper the author describes the methods and appliances necessary to determine the specific gravity, congealing point, optical rotation, and refractive power of these oils, which will be consulted with interest by pharmacists who are not already familiar with these operations as applied in such cases. In the case of larger quantities of material under examination, the *specific gravity* may be ascertained in the usual manner, either by the aid of the sp. gr. bottle, the hydrometer, or the hydrostatic balance; when the quantities of oil are very small, however, the aid of a Sprengel tube is called into requisition. This may be constructed by bending a piece of glass tubing, about four inches long, in the form shown by Fig. 75, the glass is then drawn to a capillary, as shown, and cut in the center of the constriction, the edges being smoothed in a flame.

The tube is dried, weighed, filled with water at the desired temperature (15° C., &c.) by suction, and again weighed to ascertain its capacity, and is then used exactly the same as in the case of a bottle. The *congealing point* is determined by immersing a test tube containing the oil and a thermometer in a mixture of ice and water, in which its temperature may be reduced to −5° C., avoiding to stir until this point is reached, when, on rubbing the thermometer along the inner side of the tube, crystallization may be induced. When this occurs, the point to which the mercury

FIG. 75.



Sprengel Tube.

column (rapidly) rises is noted as the congealing point. The principle and construction of the polariscope is explained very comprehensively, with suitable illustrations, a particular description being given of Laurent's instrument of the "half-shadow type;" but for this reference must be had to the original paper. The *refractive power* of the oils may be determined by means of "Abbe's refractometer," a generally useful instrument, which may be used for many other purposes besides the examination of volatile oils. The author also proposes a different method for determining their *solubility in alcohol.* Instead of using alcohol of different strengths—70, 80, 90 or 95 per cent.—he recommends the use of strong alcohol, sp. gr. 0.799 at 15.5° C., in the following manner: Five cubic centimeters of oil are mixed with 10 Cc. of the alcohol; water is then run into the solution from a burette until the solution becomes turbid. The number of cubic centimeters of water required to produce turbidity is multiplied by 100, the result being termed the *solubility value.* The end reaction is very distinct. Oils of great solubility usually given an opalescent solution before becoming turbid.—Chem. and Drugg., April 28, 1900, 700.

Essential Oils—Analysis and Fractionation.—In a highly interesting paper on the analysis of essential oils, Dr. Clemens Kleber, who by reason of his experience speaks authoritatively, observes that proper systematic researches in this interesting group of bodies were not possible before the excellent investigations of Wallach, Semmler, Tiemann and others (all of

comparatively recent date.—Rep.), had furnished the clew for the separation and identification of the compound parts of the peculiar substances. It is, however, still to-day impossible, and will, perhaps, in consequence of the complication and the peculiar nature of a great part of the substances in question, ever be so—to isolate, qualitatively and quantitatively, all the constituents of an essential oil by following a fixed scheme like that which has been worked out for an organic analysis, be it only for the reason that the list of bodies occurring in essential oils is still far from being complete, and that every new investigation may result in the detection of hitherto unobserved compounds. The author reviews the conditions which may affect the characters and composition of one and the same oil, dependent not alone on those which prevail in the course of preparation, such as selection and age of material, conditions of growth, method of preparation, but also the unavoidable changes that may occur in the course of the analytical processes to which the oil is subjected. It is therefore very desirable as a preliminary to the actual analysis to ascertain and note the following points: (1) Genus and species of the plant which furnished the material; (2) what parts of the plants have furnished the oil; (3) in what stage of growth, respectively at what time was the material collected; (4) how was the distillation effected (on dry or fresh material, after fermentation or not, with water or with steam, etc); (5) how and how long had the oil been kept between preparation and analysis; (6) specific gravity; 7) optical rotation, refraction and dispersion; (8) solubility in alcohol of various strength; (9) saponification and esterification numbers. Some of these data furnish indications which greatly facilitate the identification of the bodies resulting from subsequent fractionation. Thus a sp. gr. below 0.84 indicates the presence of large quantities of aliphatic compounds; a sp. gr. above 0.9 betrays the presence of oxygenated compounds, above 1.0 that of aromatic bodies, etc. Insolubility in 70 or 80 per cent. alcohol indicates hydrocarbons; insolubility in larger quantities of 90 per cent. alcohol, paraffin, sesqui- and polyterpenes, while from the saponification figures before and after acetylation the amount of esters, lactones and alcoholic bodies may be estimated.

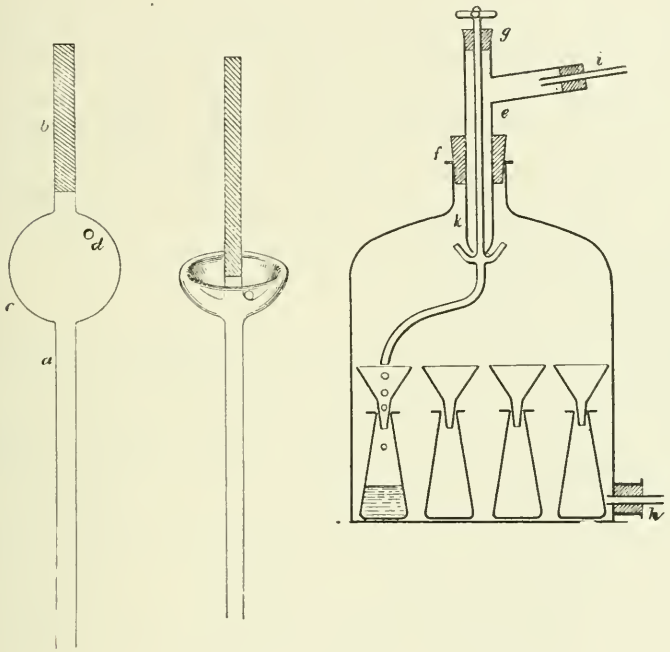
Useful and indispensable as the process of fractional distillation is in the analytical treatment of essential oils, it is at the same time so very slow and imperfect that every other known method which leads to the removal of one or the other constituent should be made use of. The author goes over this ground very thoroughly. Many bodies which are solid at ordinary or lower temperatures may be crystallized from the oil by exposure to cold. Aldehydes and some ketones—especially methylic—may be isolated by combining them with sodium bisulphite, though many of them, such as the unsaturated aldehydes, as citrals, citronellal, cinnamic aldehyde, etc., or some ketones and aldehydes, like acetone, acetic aldehyde, vanillin, etc., may require special treatment to effect separation. The acids and

phenols, esters and lactones, are removed by treatment with caustic alkali solution, here also under certain individual and specific modifications owing to the greater or less care with which some of them are modified or changed by prolonged action of alkali. These and other bodies having been removed whenever practicable, the process of fractional distillation is resorted to. A very common fault of beginners is to take from the start fractions within very narrow intervals of temperature, in the opinion thus to effect quicker fractionation. Not only that this is not so, such a proceeding is quite misleading, if we consider the very imperfect separation during the first fractionation. It is much better first to divide the whole oil under process of analysis into four or five equal fractions, without much regard to their boiling points. The latter may be for instance, 170°–185°, 185°–210°, 210–240°, 240°–280°. Now, starting again with the first fraction, it will begin to boil possibly at 160°, but the fraction is again taken up at 185°. Some liquid is doubtless left in the flask, to which the fraction 185°–210° is added, when, on starting again, some distillate below and up to 185° is obtained, which is added to the fraction 160°–185° and a fraction 185°–210° is again taken. To the residue the fraction 210°–240° is added, and so on, the fraction below and to 210° being added to the previous fraction, etc., etc., and four fractions are thus again obtained, but in proportions rather different from the original fractions. The fractionation within the same limits of temperature may be repeated a third time, after which the ranges of temperature are brought closer together, the fraction 160°–185° being divided into fractions 160° to 172° and 172°–185°, and so on, until after a sufficient number of fractionations the intervals of temperature may be shorter to from 5°–5°, and finally to within 2° or 3°, which is as close as is practically necessary under ordinary conditions.

If the facilities of a laboratory render it possible, the fractionation of an essential oil should be performed as much as possible under reduced pressure. A vacuum of about 15 millimeters, obtainable by a good water jet pump, is the most recommendable, but a pump of minor efficiency will render good service. But in spite of the evident advantages, vacuum distillation is not used as much as it deserves, because of the inconvenience occasioned by the frequent interruption of the vacuum. This inconvenience is overcome by the simple apparatus devised by the author, and here shown in illustration. An ordinary glass tube (*a* Fig. 76) and a good round glass rod (*b*), both about the thickness of a pencil, are soldered together, and a bulb (*c*) blown out from the former, about 1 inch in diameter and provided with a hole(*d*). The upper half of this bulb is then softened before the gas blast and forced down, so that a kind of double-walled cup is formed, with a hole in the bottom of the inner wall, as shown by Fig. 77. Now insert a glass tee (*e*) into the upper tubulure of an ordinary bitubular exsiccator (Fig. 78) by means of a rubber stopper (*f*),

and into the tee the cup-piece (Fig. 77), by means of a cork saturated with paraffin and smoothly bored, after the lower end has been suitably bent as shown in Fig. 78. The lower end of the tee, which reaches into the

Fig. 76. Fig. 77. Fig. 78.



cup, is somewhat tapering, so that a small annular space is formed around the inner tube. The upper end of the glass rod is provided with a handle, which is detachable, so that the glass rod can be pulled through the cork when the cup-piece needs cleaning. The use of the apparatus is self-evident; after it has been evacuated through the tubulure *h*, the distilling liquid enters at *i*, flows through the annular space into the cup and through the hole in the bottom of the latter, and thus through the bent tube into one of the receiving flasks, which have been placed in a circle on the glass plate of the exsiccator. The tee is, in the interior of the latter, on the side opposite the inlet, provided with a small hole (*k*), through which air entering with the distillate can escape, and so prevent spatting out of the cup. To take a new fraction, it is simply necessary to turn the handle till the liquid drops into the next receiver, and this is the only portion of the apparatus that has to be moved during the entire operation. Several forms of dephlegmators (distilling flasks) are described and shown by accompanying cuts. The one generally preferred by the author is a simple tube, about ¾ inch wide, longer for low boiling and shorter for

high boiling substances; near the upper end it has a lateral discharge-tube, near the lower end it is narrow so as to afford a rest for larger pieces of glass, upon which smaller pieces, or thin glass tubes, are placed nearly up to the lateral outlet. For high boiling liquids ordinary fractionation flasks are used, provided with an offset before the gas blast; the space between the latter and the lateral tube being filled with broken glass. When the use of a capillary tube is indispensable, to prevent bumping, a specially constructed flask must be employed. These flasks are articles of commerce, while the essential parts of the receiving vessel can be constructed by any one with a little skill in glass blowing from materials found in every laboratory. Mr. Kleber's paper is concluded with a long list of the known components, and products of their decomposition, of essential oils, giving their boiling points and melting points so far as they have been determined.—Amer. Jour. Phar., Dec. 1899, 566–548.

Volatile Oils—Adulterations.—A. R. L. Dohme has contributed a scholarly paper on adulteration of oils, in which he considers particularly the volatile oils of savin, of eucalyptus, of juniper and of sandal. The three first named being terebinthinate oils and most likely to contain turpentine oil as an adulterant, this oil, of which three kinds are known to commerce —French or Venetian, American, and Russian or Swedish turpentine oil— was first studied, and the literature gone over so as to recognize its presence in the other oils. In the case of each of the four oils examined the author reviews the characteristics of the genuine and pure oils for the purpose of sharply defining the distinctions from the adulterated article. In reference to *oil of savin*, he observes that pure savin oil is practically unknown. It has a decided brownish-green color, and is quite penetrating in odor and dense to semi-viscosity. The U. S. P. savin oil is not a pure oil, but is an adulterated article; but, while the U. S. P. article is not pure, the savin oil examined by the author is much less so, since it contains only about 20 per cent. of savin oil, the balance being turpentine oil. *Oil of sandal*, which was examined in two examples, was either adulterated with some terpene or is not an East Indian sandal oil, but a West Indian and considerably inferior; for, while the U. S. P. does not require an official standard of santalal or santalol, the commercial oil was very deficient in these as compared with pure East Indian oil. *Oil of juniper* apparently contained about 50 per cent. of turpentine oil, but whether or not this should be present in pure juniper oil cannot be decided until more is known about the constituents of juniper oil and the amount of pinene or turpentine oil it should normally contain. *Eucalyptus oils* vary much in composition, odor and properties according to the member of the eucalyptus family they are distilled from. The sample examined, containing 86 per cent. of eucalyptol, must be considered a good oil, whatever its source, and was certainly not adulterated.—Proc. Maryland Pharm. Assoc., 1899, 80–84.

Volatile Oils—Estimation in Alcoholic Solutions.—Prof. Wender recommends a simple method for the estimation of volatile oils in alcoholic solutions, an operation which presents considerable difficulty as ordinarily carried out. He employs for this purpose a pear-shaped flask of 100 Cc. capacity, having a narrow neck about 10 Cm. in length and ending in a globular bulb of 25 Cc. capacity, capable of being closed by a rubber stopper. The neck of the flask has a capacity of exactly 2 Cc., and is graduated into 20 equal parts [$= \frac{1}{10}$ Cc. each]. The method is carried out as follows: 50 Cc. of the alcoholtc solution are poured into the flask, a few drops of diluted sulphuric acid are added, followed by water until the highest mark on the scale in the neck is reached, the temperature of the apparatus and contents being adjusted in a water bath to exactly 20°C. To the milky fluid thus produced, 25 Cc. of petroleum ether are added, the stopper is inserted and the apparatus is vigorously shaken during 10 minutes. It is then allowed to stand in the water-bath at the temperature mentioned, until the petroleum ether layer has separated completely and the lower alcoholic layer appears clear, when the diminution in the volume of the latter may be read off on the scale, and on multiplying by 2 the exact percentage of volatile oil is ascertained. The process is in the experience of the author quite accurate. It may also be applied to the determination of the percentage of volatile oil in drugs, by macerating these in alcohol, distilling, and subjecting the distillate to the examination described.—From Pharm. Post, 1900, 70, in Apoth. Ztg., Feb. 10, 1900, 99.

Volatile Oils—Estimation in Spices.—Karl Mann recommends the following method for the quantitative estimation of volatile oils in spices. The substance under examination, properly comminuted, is mixed with pieces of pumice of the size of a hemp seed and subjected to distillation with steam. The distillate is collected in a graduated cylinder, saturated with sodium chloride, and shaken out with rhigolene, and an aliquot part of the rhigolene solution subjected to evaporation in a small weighing-flask by exposing it to a current of dry air. The low temperature produced by the evaporation of the rhigolene prevents the vaporization of any of the volatile oil, and, if the air saturated with the rhigolene vapor is passed through a non luminous gas flame, the latter becomes carburetted and consequently luminous so long as rhigolene is vaporized. In this way the completion of the evaporation is sharply defined: the two stop-cocks of the weighing flask are closed, it is dried in an exsiccator and weighed.—Apoth. Ztg., Feb. 21, 1900, 124; from Chem. Ztg., 1900, 124.

Essential Oils—Solubility of Oxygenated Constituents in Aqueous Solutions of Sodium Salicylate.—Duyk has carefully studied the property of aqueous solutions of sodium salicylate, of giving a clear solution with the oxygenous constituents of essential oils. The maximum power of solution is possessed by a solution of the salicylate in an equal part of water, this being a colorless liquid of sp. gr. 1.240. The solubility of a number of

pure alcohols, ketones, aldehydes and phenols was determined by first dissolving 1 Cc. of the material in 4 Cc. of the salicylate solution, and then adding water by drops, with constant shaking, until permanent cloudiness ensued. For this purpose the eugenol solution required 3.5 Cc. of water; geraniol and benzaldehyde, each 2.5 Cc.; carvone, 2.0 Cc.; citral, 1.7 Cc.; cineol and cinnamic aldehyde, each 1.5 Cc.: and citronellal solution, 0 5 Cc. of water. The hydrocarbons of the terpene series are insoluble, or nearly so, and can therefore be, for the greater part, separated from the oxygenous bodies with which they are associated; but a sharp separation is not possible, since the hydrocarbons, though practically insoluble in the pure salicylate solution by themselves, are absorbed to a greater or less degree in the presence of oxygenous bodies already in solution. The author distinguishes the oxygenous bodies by their ready solubility and by their difficult solubility or insolubility in the salicylate solution described—thus:

1. EASILY SOLUBLE: *a. Alcohols:* Geraniol, linalool, citronellol, borneol, menthol. *b. Aldehydes:* Benzaldehyde, salicylic aldehyde, anisic aldehyde, cinnamic aldehyde, citral, citronellal, cuminic aldehyde, vanillin, heliotropin. *c. Ketones:* Carvone, methyl-heptenone, pulegone, methyl-nonyl-ketone, thujone, camphor. *d. Phenols:* Eugenol, thymol, carvacrol. *e.* Cineol. Of these bodies only menthol and camphor are less soluble than the others.

2. LESS SOLUBLE, OR INSOLUBLE: *A. Sesqui-terpene alcohols:* Santalol. *b. Phenol derivatives:* Anethol, safrol, apiol. *c. Esters:* of borneol, of geraniol, of linalool, of menthol. It is interesting that the esters are much less soluble than the alcohols from which they are derived.—Schimmel's Rep., Oct. 1899, 58–59; from Ann. de Pharm., *5* (1899), 348.

Essential Oils—Production in Cyprus.—According to P. Gennadius, Director of Agriculture, who gives much attention to the production of essential oils in Cyprus, the ancient fame of the perfumers of Cyprus bids fair to be revived by efforts that are now made in certain villages. The native flora of the island is rich in aromatic plants which can be utilized for perfume making, while of plants introduced in the island, the violet, jasmine, citrus trees, *Pelargonium odoratissimum*, Damascus rose, lavender and rosemary, are common and grow almost without any special treatment.—Pharm. Journ., July 1, 1899, 9.

Oil of Turpentine—Satisfactory Commercial Quality.—Charles H. LaWall and Robert C. Pursel observe that the oil of turpentine examined by them during the past year conformed in nearly every instance with the U. S. P. requirements. Twelve lots, aggregating about 400 barrels, were examined with the following average results: Specific gravity, 0.8523: boiling point between 149° and 166° C. The solubility was correct in every

instance, while slightly abnormal residues of distillation were found only in two samples and decidedly abnormal residue in one sample. The specific gravity in the latter case was 0.8306, while the boiling point ranged from 80° to 170° C.—Amer. Journ. Pharm., Aug. 1899, 396; Proc. Penna. Phar. Assoc., 1899, 156.

Pine-needle Oil.—A fine Quality from Abies pectinata.—Schimmel & Co. draw attention to the beautiful oil distilled in the Alps from the young shoots of Abies pectinata, which is now brought to the market in large quantities, and finds sale under the name of "extra-fine pine-needle oil." It is not only used for medicinal purposes, embrocations, etc., but also—on account of its fine aroma—for perfumery purposes.—Schimmel's Rep., Oct. 1899, 49.

Oil of Pinus Sabiniana—Inquiry Concerning its Alleged Constituent, Abietene.—Prof. Edward Kremers discusses the questions that have arisen owing to the discovery, in 1871, of a peculiar hydrocarbon as the principal constituent of a coniferous oil supposed to have been distilled, in California, from *Pinus sabiniana*, commonly known as the nut pine or Digger pine. While this, at the time, was found to possess characters distinct from ordinary coniferous oils, it was not suspected to be, as has since been proven, a normal heptane, and was distinguished by its discoverer from other oils by its inertness towards reagents and its substitution by chlorine, and by contrasting its properties with those of oils containing terpenes. In 1879 Thorpe made a careful study and analysis of this oil, and of its principal constituent, and identified it with normal heptane. The oil being a commercial product, having enjoyed in California a reputation under the names of abietene, erasine, aurantine, etc., for the removal of grease and paint from clothing and fabrics, as an efficient substitute for petroleum benzin, its source has naturally been called into question. Sadtler (1879) had information that it was derived from *Pinus ponderosa*, while very recently (1897) Trimble expressed the belief that *Pinus Jeffreyi* is the source of the commercial oil. The question as to the botanical source of abietene is therefore still more or less an open one, but the fact remains reasonably certain that the oil, whatever its source may be, is devoid of pinene, and that its principal constituent is a hydrocarbon corresponding in most of its characters to normal heptane.—Pharm. Rev., April, 1900, 165–172.

Savin Oil—Constituents.—During the manufacture of comparatively large quantities of sabinol, $C_{10}H_{16}O$—the alcohol recently discovered by Fromm in oil of savin—the attention of Messrs. Schimmel & Co. was attracted to the fraction of the saponified oil, boiling from 220° up to 230° C., by an odor suggestive of cuminaldehyde. When shaken with a solution of sodium bisulphite, a crystalline double compound rapidly separated out, which, after isolation in the usual manner from oily admixture, when

decomposed with solution of soda, yielded a thinnish oil, the odor of which only remotely suggested cuminaldehyde. It boiled under a pressure of 20 Mm. at 127° to 129° C., had a sp. gr. of 0.9163 at 16°, and rotated to the right $a_D = -11°40'$. It remains to determine, when further material is available, whether the substance under consideration is an aldehyde or a ketone.—Schimmel & Co.'s Semi-An. Rep., April 1900, 43.

Pinenol—A New Terpenic Alcohol.—By the action of nitrous fumes, or of nitrogen peroxide, on pinene, cooled by means of a freezing mixture of ice and salt, P. Genevresse has obtained a new terpenic alcohol, pinenol, $C_{10}H_{16}O$. On distilling the crude product of the reaction in steam, the unattacked pinene is first volatilized, then pinenol, with a trace of a nitrogen derivative. This last is decomposed by distillation under ordinary pressure, and then the pinenol is distilled off under reduced pressure. It is a pale yellow fluid with a characteristic, agreeable odor. It boils at 225° C. at 740 Mm. pressure, and at 144° at 38 Mm. Its sp. gr. at 0° C. is 0.9952, and its refraction index, 1.497. It is insoluble in water, but dissolves in all proportions in alcohol; it is lævogyre, the rotation being —14°.66. With phosphoric anhydride it parts with a molecule of H_2O, forming cymene, $C_{10}H_{14}$. When acetylized, it forms the ester $C_{10}H_{15}O.CH_3$, which has a lavender odor, and boils at 150° C. under 44 Mm. pressure. When treated with chromic anhydride and sulphuric acid, it forms the ketone, pinenone, $C_{10}H_{14}O_2$, having a pleasant odor, and an optical rotation of —21°.12, and a sp. gr. of 0.9953 at 0° C. With hydroxylamine hydrochloride it forms pinenoxime $C_{10}H_{14}:NOH$ in orthorhombic crystals, melting at 89° C. With bromine this body gives a dibromo-compound $C_{10}H_{14}Br_2NOH$, melting at 152° C., and with benzoyl chloride it yields the derivative $C_{10}H_{14}NO.CO.C_6H_5$, crystallizing in fine crystals which melt at 105° C.—Pharm. Journ., May 26, 1900, 567; from Compt. rend., *130*, 918.

Terebene—Examination of Commercial Samples.—Lewis Ough has subjected twelve commercial samples of terebene—two of German origin, the others the products of responsible English houses—to examination in order to ascertain how nearly they responded to the requirements of the B. P., 1898. The results obtained show that commercial terebene is most varied in its composition, only a single sample of the series being in strict accordance with the B. P. requirement. The specific gravities varied from 0.858 to 0.876; with a single exception they were more or less colored, some slightly, others distinctly yellow; seven were neutral, two slightly alkaline, one slightly acid; they all varied in their boiling point, the amounts distilling below 329° F., for instance, being 1, 4, 9, 12, 15, 20, 25, 45, 62, 62, 62.5 and 75 per cent., the first five mentioned alone fulfilling the tests of boiling limit and amounts distilling below 329° F. In their solubility they varied as follows: In 90 per cent. alcohol, from 1 in 4.75

to 1 in 6; in pure ether (sp. gr. 0.720), from 1 in 10 to 1 in 20—the majority in 10 to 11; in methylated ether (sp. gr. 0.717), from 1 in 1.4 to 1 in 5—the majority in 2.5 or less. Optically, three of the samples were inactive, the others ranged from 1.0°—to 5.45° +.—Trans. Brit. Pharm. Conf., 1899, 396–400.

Terpin Hydrate—Preparation by the Aid of Hydrogen Dioxide.—The method usually employed for preparing terpin hydrate consists, as is well known, in allowing 8 p. oil of turpentine, 2 p. nitric acid, sp. gr., 1.25, and 1 p. alcohol to react upon each other. Several years ago it was proposed to substitute methyl alcohol for ethyl alcohol, and to employ a stronger acid (sp. gr., 1.353), but to add some water, after three days' standing, in order to avoid too violent reaction and consequent production of a brown, tough mass, instead of crystals. L. Krentmann, who calls attention to these conditions, mentions that very good results are obtained if the alcohol is replaced by hydrogen dioxide. In the course of a few hours after such a mixture is effected, in shallow capsules exposed to daylight, crystallization begins, and continues uninterrupted to completion of the reaction. —Pharm. Ztg., April 18, 1900, 296.

Terpenes of Lemon Oil—Use as adulterant of Italian Volatile Oils.—Schimmel & Co. point out that the adulteration of commercial oils by means of turpentine has almost ceased. But instead of this, certain firms in Messina have taken up the adulteration of Italian oils by means of the terpenes from the manufacture of terpeneless lemon oil, an industry which is carried on upon a large scale by some firms. The difficulty of proving beyond a doubt such adulteration, has resulted in making the legal enactments against the adulteration of essential oils practically inoperative, and efforts are being made to get the government to place under control all factories of terpeneless lemon oil, and if possible to render the terpene itself useless for purposes of mixing by denaturating it with some coloring. substance.—Schimmel's Report, October, 1899, 30.

Citral—Determination in Oil of Lemon.—Schimmel & Co., referring to a recent paper by Soldaini and Berté on the requirements and tests for lemon oil (Boll. Chimico farmaceutico, *38* (1899) 537), mention that they have frequently pointed out that it has so far been impossible to obtain absolutely accurate results with the bisulphite method of determining the aldehyde citral, present. So the process recommended by the authors named yields at most only relatively comparable, never absolutely accurate results, although the apparatus possesses certain advantages that merit attention. They require in good lemon oil an aldehyde proportion of about 6.5 Cc. in 100 Gm. of oil, and prefer to estimate it by means of potassium bisulphite instead of the customary sodium salt. Five Cc. of oil of lemon, measured at a known temperature, are introduced into a fractioning flask holding about 100 Cc., the neck of which should taper to such an extent

that it may be united by means of rubber tubing with the inverted pipette, graduated to $\frac{1}{40}$ Cc., and used for introducing the oil. The side tube of the flask is bent upward, and may be closed by a piece of india-rubber tube and cock. To the oil in the flask, 25 Cc. of solution of potassium bisulphite, slightly supersaturated with sulphurous acid, are added; the mixture is agitated briskly, heated for 10 minutes on a boiling water bath with brisk shaking at short intervals, care being taken to heat the flask only so much that the bottom may be touched by the naked hand. Then, with constant shaking, it is allowed to cool, again heated for 5 minutes with constant shaking, and finally allowed to cool completely. The side tube is next united with a funnel tube for the introduction of water. The cleaned and dried pipette is placed inverted upon the top-opening of the flask, and united by means of india-rubber tubing, as explained, and water carefully introduced through the funnel tube until the uncombined oil rises into the pipette, in which its volume may be read off from the scale. Care must be taken to dislodge isolated oil-drops from the sides of the flask, so that all the oil may accumulate in the pipette. This may be accomplished by gentle tapping, and allowing bubbles of air to enter through the side tube.—Schimmel's Semi-An. Rep., April, 1900, 25.

Oil of Lemon—Percentage of Citral Content.—Some interesting observations on the percentage of citral in pure natural oil of lemon are communicated from the research laboratory of the London Essence Company. It is generally stated that genuine oil of lemon should contain from 7 to 7.5 per cent. of citral, this statement being made in most text-books and published works. Presuming that by citral is meant an aldehyde having a formula $C_9H_{15}COH$—in reality a mixture of two aldehydes, consisting mainly of citral and a small percentage of citronellal—the authors of the present communication express a strong doubt of the correctness of this statement. They find that by estimations by the bisulphite method, an amount of aldehyde approaching 7 per cent. is not obtained. Neither can as much as 7 per cent. of total flavoring-portion be obtained by careful fractionation, nor does the index of refraction indicate so high a percentage, while makers of terpeneless and concentrated oil of lemon only obtain from 3 to 4 per cent. of total flavoring-matter, of which only a small percentage is of an aldehydic nature. They have convinced themselves by their own experiments, and their observation is confirmed by experiments made by A. C. Chapman, that the bisulphite method of estimating the aldehydes in oil of lemon is accurate and reliable—the data obtained in both cases being given in the present paper. Applying this method to specimens of oil of lemon whose genuineness was beyond question, they found them to contain from 3 to 4 per cent. of citral, and in no case more. By fractionation, moreover, the total quantity of flavoring-matter never exceeded 5 per cent. These observations, also, are borne out by a report received from Mr. Chapman.—Drugg. and Chem., Aug. 26, 1899, 372.

Oil of Lemon—Citral Content.—Ernest J. Parry, referring to the statement of the chemists of the London Essence Company that no pure oil of lemon contained more than 4 per cent. of citral, emphatically disagrees wtih this statement. He has obtained numerous samples of oil from Messina and Palermo, under guarantee that they contained specified percentages of citral, and he found these percentages invariably as represented, and that between 5 and 6 per cent. is a very common citral content. The question of exact estimation of citral is naturally of importance. He finds the method of the late Professor Tiemann, which depends on the formation of citralidene-cyanacetic acid, to be the most reliable for the estimation of citral in lemon oil, obtaining almost exactly concordant results, when operating as follows: Two hundred cubic centimeters of the oil are concentrated to 25 Cc. in a Wurtz flask under a pressure which should not exceed 15 Mm. The 175 Cc. of terpenes obtained contain a little citral, but the quantity is so small that it may be neglected. Ten cubic centimeters of the residue, of which the sp. gr. is known, is shaken with a solution of 5 grammes of cyanacetic acid and 5 grammes of ordinary caustic soda in 30 Cc. of water in a small absorption-flask with a long graduated neck, and the non-absorbed residue read off as usual. The sp. gr. of citral is so near that of the concentrated oil used that they may be taken as identical. In duplicate experiments on the same oils, the following results were obtained:

Sp. gr. of oil, 0.860.
Sp. gr. of concentrated 25 Cc., 0.898.

10 Cc. (= 80 Cc. original oil) gave { (*a*) 4.35; (*β*) 4.30, absorbed.
{ (*a*) 5.65; (*β*) 5.70, unabsorbed.

Taking the sp. gr. of citral as 0.897, the results become 5.67 per cent. and 5.61 per cent. The only objection to the cyanacetic acid is a somewhat expensive reagent.—Chem. & Drugg., March 3, 1900, 376.

Terpeneless Lemon and Orange Oils—Variation in Commerce.—T. H. Williams Idris has subjected thirteen samples of so-called terpeneless oil of lemon to examination and comparison with two terpeneless oils prepared in his own laboratory from the purest oil of lemon obtainable: One of his own samples had a sp. gr. of 0.8966 at 15.5°; optical rotation in 100 Mm. tube, —8°53′; absorbed by solution $NaHSO_3$, 62 per cent.; not absorbed, 38 per cent. The other differed very slightly, its sp. gr. being 0.8963, optical rotation, —7°, and absorption by $NaHSO_3$, 61 per cent. His results with the commercial samples are shown in the following table:

No.	Sp. gr. at 15.5°.	Rotation in 10 mm. tube.	Absorbed by $NaHSO_3$.	Not absorbed.	Solubility in 70 per cent. alcohol.	Solubility in 90 per cent. alcohol.
			Per cent.	Per cent.		
1	.8956	—7° 12′	67	33	1 in 9	In all proportions.
2	.8963	—7° 21′	42	58	1 in 20	" "
3	.8712	+ 41° 21′	8	92	Very insoluble	1 in 4
4	.8966	—11° 5′	6	94	" "	1 in 4
5	.8943	—1° 41′	76	24	1 in 3	In all proportions.
6	.8836	10° 58′	30	70	Very insoluble	1 in 3
7	.9036	—6° 20′	51	49	1 in 2	In all proportions.
8	.8698	+ 42° 6′	15	85	Very insoluble	Very insoluble.
9	.8707	38° 21′	14	86	" "	" "
10	.8966	— 2° 8′	70	30	1 in 40	In all proportions.
11	.8925	—7° 15′	61	39	1 in 15	" "
12	.8956	0°	66	34	1 in 6	" "
13	.8955	0°	67	33	1 in 7	" "

The author's samples were soluble in all proportions of 90 per cent. alcohol, and in 20 to 30 volumes of 70 per cent. alcohol. Nos. 1, 2 and 11 are evidently genuine terpeneless lemon oils. Samples Nos. 3, 6, 8 and 9 are ordinary lemon oil to which a little citral had been added, or from which a portion of the terpenes had been removed. No. 7, sold as "synthetic oil," had a marked verbena odor, as had 5, 12 and 13, and lemongrass citral evidently entered into the composition of the last three. No. 4 contained very little citral, while No. 10 was undoubtedly a genuine product, having a fine lemon odor, but was contaminated with a little terpene. Four samples of

Terpeneless Orange Oil were examined but not compared with a product of the author's own make. Their specific gravities were 0.890, 0.894, 0.878 and 0.884, and their optical rotation in the same order, + 17°, + 12° 8′, + 33° 4′ and + °40′, respectively. The low sp. gr. and high optical rotation of the last two samples indicate the presence of a considerable quantity of terpene.—Trans. Brit. Phar. Conf., 1899, 447–450.

Oil of Lemon—Volumetric Estimation of Aldehydes.—I. Walther recommends a volumetric method for estimating the aldehydes of oil of lemon, citral and citronellal, which depends on the conversion of these into oximes by means of hydroxylamine hydrochloride, and determining their quantity by the amount of the reagent consumed. He has found that hydroxylamine hydrochloride may be heated for a long time in the presence of sodium bicarbonate in neutral media, such as alcohol or oil of turpentine, without decomposition of hydroxylamine, but that in the presence of aldehydes, such as citral or citronellal, a quantity of it is consumed in the formation of their oximes, corresponding to the quantity of these aldehydes present. Referring to the original paper for the details of the method, it may be stated here briefly that to about 10 Gm. of a freshly prepared solution of

hydroxylamine hydrochloride in 80 per cent. alcohol (about 1–20), of known titre determined by $\frac{N}{10}$ sodidum hydrate, a definite quantity of the oil of lemon is added, together with sufficient absolute alcohol to produce a clear solution. Then, having added from 0.5 to 1.0 Gm. of sodium bicarbonate, the mixture is heated to boiling in a capacious (150 Cc.) flask, provided with a reflux condenser, on a water-bath for ¾ hour. When cool, the contents of the flask are transferred to a measuring flask, diluted with water, part of which is used for rinsing the distilling flask, to 250 Cc., and an aliquot part (say 25 Cc.) is neutralized with diluted hydrochloric acid, after the addition of a drop of methyl orange, to the beginning of a rose-red reaction. Phenolpthalein is then added and the liquid titrated with $\frac{N}{10}$ sodium hydrate until the rose-red of phenolphthalein manifests itself. From the number of Cc. of the sodium hydrate solution employed the quantity of hydroxylamine consumed is determined, and from this the percentage of aldehydes is calculated as citral, $C_{10}H_{16}O$, or citronellal, $C_{10}H_{18}O$. The percentage of aldehydes in pure oil of lemon has in this way been determined to average closely on 5 per cent.; the lowest being 4.88 per cent., the high st 5.37 per cent., except in the case of a so-called "extra strong" oil of lemon, which in three determinations gave 8.1016, 8.17 and 8.21 per cent. The author has convinced himself of the accuracy of the method by parallel experiments with mixtures of pure citral and oil of turpentine. His results justify the assumption that pure natural oil of lemon contains about 5 per cent. of aldehydes, a figure which conflicts with the statement of Schimmel & Co., that the pure oil should contain from 7 to 8 per cent. of aldehydes. — Pharm. Centralh., Oct. 12, 1899, 621–625.

Oil of Lemon—Adulteration with Stearin.—G. Boswig has noticed an adulteration of oil of lemon with stearin, which may be present to the amount of 8 per cent. without materially affecting its sp. gr. Its presence is indicated by the turbidity of the oil, but can be established only by saponification and regular analysis of the potassium salt obtained.—Chem. and Drug., 1899.

Oil of Orange—A New Constituent.—Mentioning the constituents that have so far been determined in orange oil, Ernest J. Parry states that in the course of work, still in progress, he has been able to isolate a small quantity of a body which has hitherto been observed only in oil of neroli, namely,

Methyl Anthranilate—the ester of ortho-amido benzoic acid. Fifteen hundred Cc. of sweet-orange oil were distilled under a pressure of 10 to 15 Mm., until 95 per cent. was collected; the remaining 5 per cent. was treated with alkaline solution of cyanacetic acid to absorb the aldehyde, and the residue was separated and freed from moisture. This was found to possess a marked and exceedingly fine fluorescence. It was then thoroughly extracted with dilute hydrochloric acid, and the aqueous laye

separated. This was rendered alkaline with caustic potash solution, and then extracted with ether. The ethereal solution was characteristically fluorescent, and left on evaporation of the solvent a very small quantity of an oil with an odor somewhat resembling neroli, and which was identical in all its properties with ordinary synthetic methyl anthranilate.—Chem. and Drugg., March 17, 1900, 462.

Orange Flower Oil—Yield on an Industrial Scale.—Jean Gras, at Cannes, records the results of 30 distillations of orange flower oil, extending over the period of collecting the flowers, from April 24 to May 15, 1899. The flowers were collected at Cannes, Cannes-Le Cannet, and Golfe-Juan, and the yield is on the basis of the distillation of equal weights of flowers and water, without redistillation of the water, as is generally done. The quantity of flowers represented by each distillation averaged about 600 kilos, the smallest being 200 and the largest 1267 kilos. The yields of oil from 1000 kilos of the flowers averaged 0.968 kilos, the smallest yield being 0.80 and the largest 1.23 kilos. It has been established by this record that the oil-content of the flowers is lowest at the beginning of the harvest, increasing considerably as the season advances. Twenty-five of the thirty distillates obtained were examined by the chemists of Messrs. Schimmel & Co., who found no difference of importance between them. The optical rotation fluctuated between + 3° 32′ and + 5° 24′, the sp. gr. between 0.873 and 0.877, at 15° C., the saponification number between 35.3 and 44.8. All the oils were soluble in 1½ volumes of 80 per cent. alcohol.—Schimmel's Rep., Oct. 1899, 41–43.

Oil of Lime Flowers—Preliminary Examination.—Ernest J. Parry has had opportunity to make a partial examination of the volatile oil distilled from the flowers of *Citrus Limetta*, an oil analogous to true neroli oil. It is of a pale yellow color, with the characteristic odor of neroli oil, but not nearly so powerful. Its sp. gr. was 0.870, and its optical rotation + 21° 30′. The quantity of oil was too small for a complete examination, but on distillation a small fraction came over at 195° to 200° C., which had a sp. gr. 0.874 and a strong odor of linalool. On acetylation it yielded linalyl acetate, of sp. gr. 0.913. By shaking the original oil with dilute hydrochloric acid, separating the aqueous liquid, rendering it alkaline, and extracting with ether, an intensely fluorescent solution was obtained, which, on allowing the solvent to evaporate spontaneously, deposited a small quantity of an oil. This deposited oil on dilution with alcohol had the characteristic and powerful odor of neroli. The acid yielded by this oil on saponification melted at 138° C. The oil is therefore *methyl anthranilate*, which has now been identified in oil of neroli (Schimmel and Erdmann), oil of jasmin (Hesse and Müller), oil of orange (Parry and Schimmel), and oil of lime-flowers (Parry).—Chem. & Drugg., June 16, 1900, 993.

Oil of Bergamot—Changes During the Ripening of the Fruit.—E.

Charabot finds that during the process of ripening, the essential oil of the fruit of *Citrus bergamia* undergoes a marked change, losing free linalool and bergaptene, but increasing in terpinic constituents, and in linalyl acetate. Thus he finds the green fruits give an oil containg 13.9 per cent. of free linalool, and 26.6 per cent. combined as esters; while that from the ripe fruit contained but 5.9 per cent. of free linalool with 29.6 per cent. as esters. The total linalool in oil from the unripe fruit being 40.5 per cent., that in the ripe fruit 35.5 per cent. Although the amount of the terpenes increases during ripening, the relative proportion of their constituents, limonene and dipentene, remains the same. - Pharm. Journ., Dec. 16, 1899, 577; from Comptes rend., 129, 728.

Oil of Cade—Chemical Examination.—By treating oil of cade with 5 per cent. solution of sodium hydrate, it was separated by Cathelineau and Hausser into a soluble and insoluble portion. The portion soluble in the soda solution was then treated consecutively with petroleum ether and amyl alcohol. The amyl alcoholic solution leaves on evaporation a *soft resin*, of which $\frac{2}{3}$ or $\frac{5}{6}$ is soluble in water, the remaining $\frac{1}{6}$ to $\frac{1}{3}$ constituting a *dry resin*, which by the action of melting alkali is split into a soluble and insoluble portion, the soluble portion giving reactions for resorcin and pyrogallol. The water-soluble portion of the *soft resin* has a faint alkaline reaction, and contains organic sodium compounds which are precipitable by acids, and are apparently for the greater part the phenol ethers of resinous bodies which may be split up under the influence of heat.—Apoth. Ztg., Sept. 6, 1899, 532; from Bull. Soc. Chim. de Paris (3) *21*, 378–380.

Caryophyllene and Cadinene—Nitroso Derivatives and their Bearing on the Characterization of the Sesquiterpenes.—Oswald Schreiner and Edward Kremers communicate the results of an exhaustive study of the nitroso derivatives of caryophyllene and cadinene and their bearing on the characterization and classification of the sesquiterpenes, which, accompanying the now well-characterized terpenes in a large number of volatile oils, are still in a chaotic state. The conditions for the investigation of these hydrocarbons of the formula $C_{15}H_{24}$ are exceedingly unfavorable. They are known as thick, easily resinifying liquids with a boiling point between the limits 250° and 280° C. Of the undoubtedly large number of sesquiterpenes, among which cadinene, caryophyllene, humulene, clovene, cedrene, cubebene and patchoulene are mentioned, only three—cadinene, caryophyllene and humulene—are sufficiently well characterized to warrant their identification. The success obtained by Wallach with the nitroso compounds of caryophyllene for its identification, has led the authors to the attempt to prepare similar compounds of cadinene. These attempts proved fruitless at first, but the conditions for their formation and separation were finally found. So far, the nitrosate and the nitrosochloride have been prepared, but the nitrosite has not yet been separated,

as its solutions appear to decompose very readily. With these two additional compounds of cadinene in hand, the authors hope that a more definite characterization of cadinene is offered and thus have contributed toward clearing up some doubtful points.—Pharm. Arch., Aug. and Sept. 1899, 273–292 and 293–300.

Eudesmol—A Crystalline Constituent of Eucalyptus Oils.—H. G. Smith gives some specific information concerning eudesmol, the crystalline stearoptene discovered by himself and R. T. Baker in eucalyptus oil (see *Stringy Bark Eucalypti*, under "Materia Medica"). It is found in the oil of many species of *Eucalyptus*, and should be present at certain times of the year in *all* eucalyptus oils which are essentially rich in eucalyptol. While the formula assigned to eudesmol shows it to be isomeric with camphor, the oxygen atom is combined in a different manner. It does not appear to be ketonic, and it cannot be reduced by sodium in alcoholic or other methods. It is specially inactive, melts at 79°–80° C., when perfectly pure, and has a tendency to form products having a lower melting point. It forms a dinitro-compound and a dibromide, but does not form a nitroso-chloride. On oxidation with dilute nitric acid, camphoronic acid is formed, but no camphoric acid. A large amount of evidence has been obtained, which appears to show that eudesmol is intermediate in the formation of eucalyptol, and that the latter is derived from the fraction containing eudesmol if the oil be kept in a crude condition for some time under ascertained conditions. Oxygen is necessary to this alteration. It seems, furthermore, probable that camphoronic acid is trimethyl tricarballylic acid, which can be constructed from the formula suggested for eudesmol. —Pharm. Journ., Sept. 30, 1899, 315.

Citronella Oil—Characters and Constituents.—The researches of Schimmel & Co. have determined that the divergence in citronella oils of commerce, in respect to specific gravity, optical rotation, solubility in 80 per cent. alcohol, and acetylizable constituents, is due to the fact that there are two varieties of genuine citronella oil, obtained from distinct varieties of *Andropogon Nardus*, L. One of these varieties, as pointed out by A. W. Winter is known as "*Lana Batu*," and yields the ordinary citronella oil of commerce. The other variety, known as "*Maha pangiri*," yields an oil of considerably finer quality. It has a comparatively low specific gravity (to 0.890), low rotation (to —3°), a high acetylizable content (up to 91 per cent.), and is much more easily soluble in 80 per cent. alcohol than the "*Lana Batu*" oil. The variety of citronella grass yielding the "*Maha pangiri*" oil is stated by Winter to have been introduced from the Malacca peninsula into Ceylon, and it is also cultivated for distillation in the Straits Settlements and in Java. A large quantity of each of the oils having been prepared, the chemists of Schimmel & Co. have undertaken a series of examinations with the view to determine their respective characters, and the difference between them, and in the present report communicate the results obtained with

"Lana Batu" Citronella Oil.—This was found to possess the following characteristics: Opt. rot.—9°36′ at 20° C.; sp. gr. 0.908 at 15° C.; easily soluble in an equal volume of 80 per cent. alcohol, but becoming cloudy with four or more volumes; saponification number after acetylization = 190.8, calculated on 61.1 per cent. geraniol and citronellal. Further examination was made with the object of detecting methyl eugenol, the presence of which was considered probable on account of the veratric acid discovered as an oxidation product of the higher fractions; to ascertain whether citronellal is really a normal constituent of citronella oil, as stated by Flatau and Labbé; to investigate the nature of the body insoluble in 80 per cent. alcohol, which apparently occurs in the higher boiling fractions; finally to determine, quantitatively, if possible, the chief constituents, viz., geraniol, citronellal and methyleugenol. The results show this oil of citronella to contain the following bodies, which may be regarded as new: l-limonene, traces of linalool, methyleugenol, a light sesquiterpene, and a heavy, dextrogyre sesquiterpene. The citronellal, when operating in accordance with the method described by Flatau and Labbé, could not be obtained, and is apparently not a normal constituent of citronella oil. As to the quantitative presence of the more important constituents, these were ascertained to be as follows: Citronellal, 28.2 per cent.; geraniol 32.9 per cent.; methyleugenol, 8.0 per cent. The results of an examination of *"Maha pangiri"* citronella oil are promised at an early date.—Schimmel's Rep., Oct. 1899, 16–26.

Citronella Oil—Superiority of the Java Product.—Schimmel & Co. again call attention to the superiority of citronella oil produced in Java called "Maha pangiri." It has a comparatively low specific gravity (up to 0.894), low rotation (up to —3°), and contains a high percentage (up to 91 per cent.) of acetylizable bodies. It is much more easily soluble in 80 per cent. alcohol than the Ceylon oil, which is distilled from a grass called "Lana Batu." As far as the present analyses go, both oils have the same constituents, but in considerably varying proportions, the Java oil, with an equal geraniol-content, containing nearly twice as much citronellal as the "Lana Batu" oil, and only a very small methyleugenol content.—Schimmel's Semi-Ann. Rep. April, 1900, 12.

Sandalwood Oil—Santalol Not a Homogeneous Body.—H. von Soden and F. Muller have studied the constituents of sandalwood oil. They find that the so-called "santalol" is not a homogeneous body, but a mixture of several alcohols. Among the non-alcoholic constituents of sandalwood oil the authors found a sesquiterpene, boiling at 261° to 262° C., sp. gr. 0.898, rotation about —21°, which seems to differ from the known sesquiterpenes. This sesquiterpene absorbs 2 mol. of hydrochloric or hydrobromic acid, or bromine, but does not form crystalline compounds, and when hydrated after Bertram's method, with glacial acetic and sulphuric acids, produces an alcohol, in small quantities, which boils at 160° to 165°C., has a sp. gr. of

0.978, is apparently optically inactive, and has an odor resembling that of cedarwood oil. Among other bodies that have not yet been investigated are a phenol, some lactone-like bodies having a fruity odor, an acid melting at 154° C., and, possibly, some borneol.—Pharm. Ztg., *44* (1899), 258.

East Indian Santal Oils—Constituents.—Guerbel has isolated the following constituents from East India santal oil: 1. Two sesquiterpenes, $C_{15}H_{24}$, viz., *α-Santalene*, b. p. 252°–252°.5 C., sp. gr. 0.9134 at 0° C., rotation —13°98′; and *β-Santalene*, b. p. 261°–262° C., sp. gr. 0.9139 at 0° C., rotation — 28°55′. 2. Two corresponding sesquiterpene alcohols, $C_{15}H_{26}O$, viz., *α-Santalol* and *β-Santalol*, which have not yet been separated from each other, the mixture varying in rotation from —9°4′ to —25°3′. 3. An aldehyde, *Santalal*, $C_{15}H_{24}O$, constituting a colorless oily liquid with a pungent odor. It boils at 180° C. under 40 Mm. pressure, and yields a crystalline semicarbazone melting at 212° C. 4. *Santalic Acid*, $C_{15}H_{24}O_2$, which may also be obtained by the oxidation of santalal. It is a weak acid, resembling camphoric acid in its character, and forms crystalline salts. It boils at 210°–212° C. under 20 Mm. pressure. 5. *Teresantalic Acid*, $C_{10}H_{14}O_2$, a solid body, melting at 157° C. and boiling at 183° C. under 28 Mm. pressure. It is volatilized by steam distillation, whereas santalic acid remains. The oil of santal employed for this investigation had the sp. gr. 0.9674 at 0° C., and its optical rotation was — 21°1′.—Pharm. Journ., April 7, 1900, 357; from Compt. rend., *130*, 417.

Peppermint Oil — Formation of its Constituents During Various Stages of the Development of the Plant. — Eugene Charabot has investigated the oil obtained from peppermint plants at three different stages of growth, with results as indicated in the following table:

	Before formation of flower buds.	After formation of flower buds.		Flowering plants.
		(*a*) leaves.	(*b*) inflorescences.	
Sp. gr. at 18° C.	0.9025	0.9016	0.9081	0.9200
Opt. rot. at 18° C.	—24° 10′	—26°	—20° 15′	— 2° 37′
Esters (as menthyl acetate)	3.7 per cent.	10.3 per cent.	7.5 per cent.	10.7 per cent.
Combined menthol	2.9 " "	8.1 " "	5.9 " "	8.4 " "
Free menthol	44.3 " "	42.1 " "	29.9 " "	32.1 " "
Total menthol	47.2 " "	50.3 " "	35.8 " "	40.5 " "
Menthone	5.2 " "	4.2 " "	10.7 " "	10.2 " "

It appears from this that at the first stage the plant yields an oil rich in menthol, but containing relatively a small proportion of esters, and a relatively small percentage of menthone; as the development of the green parts of the plant progresses, however, the preparation of esters increases, and this etherification takes place in the leaves, for when the oil passes

from them towards the inflorescences, it becomes less rich in esters. Menthone, however, appears to be chiefly formed in the flowers, where it increases during the development of the inflorescence, while the proportion of total menthol diminishes. It is concluded, therefore, that, as in the case of lavender, etherification is confined to the chlorophyll-bearing parts, and that menthone is formed in the flower by the oxidation of menthol.—Pharm. Journ., Mar. 17, 1900, 277; from Compt. rend., *130*, 518.

Peppermint Oil—An Efficient Substitute from Coal Tar Oil.—According to a patented process coal tar oil yields two ketones possessing a fine odor of peppermint oil. After treatment with soda solution to remove the phenol in the coal tar, it is shaken out with hydrochloric acid, which on dilution with water and distillation with steam, yields a mixture of ketones resulting from the action of the acid, the greater portion of which passes over between 185° and 205° C. By fractionating this mixture of ketones and purifying them by conversion into the benzoyl derivatives of their oximes, two ketones may be isolated, one melting at 10°, boiling at 192°, having the formula $C_7H_{16}O$, and the other, having the formula $C_7H_{12}O$, boiling at 192° to 193°. Neither of these ketones form compounds with bisulphite, but both take up bromine from its solutions in carbon disulphide, and have an odor so closely resembling that of fine peppermint oil that they may be advantageously employed as substitutes for the latter for preparing essences and the like.—Pharm. Post, Oct. 15, 1899, 567.

Oil of Lavender—Variability According to the Stages of Flowering.—E. Charabot has examined the volatile oil of lavender at different periods during the flowering of the plant, and finds that the amount of free and of total alcohols, and also that of the free acids, diminishes until the flowers are fully expanded, while the amount of esters increases. When, however, the flowers fade, the reverse results, showing that the esters are derived directly by the action of the free acids on the alcohols. Under these conditions, during the development of the plant, a portion of the linalool is converted into esters, and another portion becomes dehydrated, so both the free and total amount of alcohol is lessened. On the other hand, as soon as etherification is completed, which is when the flowers begin to fade, the proportion of alcohol rapidly increases. The following table shows the results obtained with the oil in these various stages:

Volatile Oil from:	Sp. Gr.	Esters.	Free Alcohols.	Total Alcohols.
Flowers in buds	0.8849	30.6 p. c.	21.0 p. c.	40.8 p. c.
Flowers freely expanded	0.8854	40.4 p. c.	16.7 p. c.	48.4 p. c.
Flowers fading	0.8821	39.75 p. c.	18.9 p. c.	50.25 p. c.

By distilling identical quantities of the herb in the three stages of de-

velopment and determining the acidity of the aqueous distillate, in terms of acetic acid per liter, the results obtained were: Buds, 0.5241 Gm.; fully expanded flowers, 0.4716 Gm.; flowers faded, 0.3846 Gm.—Pharm. Journ., Mar. 10, 1900, 249; from Compt. rend., *130*, 257.

Oil of Caraway—Methyl Alcohol and Furfurol By-product of its Distillation.—In a former report of Schimmel & Co., attention was called to the production of methyl alcohol and furfurol in the course of the distillation of oil of cloves from cloves and clove stems (see Proceedings, 1897, 650). The same substances have now been discovered by them in the water of distillation from caraway, only the two substances are not found in as large a proportion. They are separated from the first runnings in the process of cohobation. The methyl alcohol from both sources is characterized by a persistent yellow color, which they believe to be due to diacetyldioxime.—Schimmel's Rep., Oct. 1899, 11–12.

Oil of Cardamoms—Practical Identity of the Product from Malabar and Mysore Seeds. — The conflicting statements concerning the oils obtained from different cardamoms has led E. J. Parry to examine some authentic oils distilled expressly for him from the seeds of Malabar and Mysore cardamoms, both cultivated in Ceylon, whence the European supply of these fruits is almost exclusively derived. The Ceylon-Malabar seeds yielded 1.3 per cent. of oil, having the sp. gr. of 0.9418 at 15.5° C., and an optical rotation at 16° C. in a 100 Mm. tube of + 40° 41′. The Ceylon-Mysore seeds yielded 2.6 per cent. of oil, having the sp. gr. of 0.9418 and an optical rotation of + 46° 39′ under the same provisions. Both were bright yellow liquids, whose odors were scarcely distinguishable. The constants obtained are in fair agreement with those given for Malabar oil, the oil which appears to be taken by distillers as their standard, but do not agree with those quoted by Schimmel & Co. for Ceylon oil, who give the sp. gr. at 0.895 to 0.910, and an optical rotation of − 12° to − 13°. In their solubility in 40 to 45 volumes of 60 per cent. alcohol, with slight opacity, they agree with the Malabar oil quoted by Haensel, who gives it at 45 volumes, but Haensel's oil has a much lower rotation, viz., − 26°. From an economic point of view it will be seen that Ceylon-Mysore cardamoms are preferable to the Ceylon-Malabars for distillation, as they give the larger yield.—Trans. Brit. Pharm. Conf., 1899, 455–457.

Poplar-bud Oil—Humulene the Principal Constituent.—Owing to its balsamic odor, poplar-bud oil is still occasionally used. It was examined by J. Picard in 1873 to 1874, who found it to consist principally of a hydrocarbon which he believed to be a diterpene. A recent analysis, by Fr. Fichter and E. Katz, however, proves that this constituent is a sesquiterpene, $C_{15}H_{24}$, boiling between 263° and 269° C., and composing the greater part of the oil, and the nitroso-compounds yielded by it further prove this sesquiterpene to be humulene. In addition to this, a second sesquiter-

pene must be contained in the oil, since the yield of the above-mentioned humulene derivatives from the corresponding fraction of hop oil is greater than that from the poplar-bud oil fraction. The oil, furthermore, contains about 0.5 per cent. of paraffin melting at 53°–68° C. The substance, to which the oil owes its agreeable aroma, passed over with the fraction boiling at the lowest point in the fractional distillation.—Schimmel & Co.'s Semi-Ann. Rep., April, 1900, 36; from Berichte, *32* (1900), 3183.

Geranium Oil—Method of Determining Free Acid.—Jeancard and Satie have examined a series of geranium oils from different sources—Cannes, Spain, Corsica, Africa, Reunion and Palmarosa oil—with special reference not only to the ester-content, but also to the quantity of free acid present. They communicate their results in the form of a table, and express the belief that by means of these examinations it will be possible to differentiate the individual oils according to their origin. For the purpose of determining the free acid, 3 Gm. of oil were dissolved in 10 Cc. of alcohol, and treated with 10 Cc. of semi-normal potash solution. After two minutes, water was added, and the excess of the alkali retitrated with sulphuric acid. The number of milligrams of potash found combined with 1 Gm. of the oil is called by the authors "the co-efficient of cold saponification," whilst the ordinary saponification number is described as the "co-efficient of saponification by heat." An interesting observation made by the authors is, that when geranium oil is kept in half-filled bottles, the proportion of free acid increases.—Schimmel & Co.'s Semi-Ann. Report, April, 1900, 29; from Bull. Soc. Chim., iii., *23* (1900), 37.

Schimmel & Co. observe, in this connection, that a more simple and more correct method of determining the acidity of the oil would be the direct titration of its alcoholic solution with potash solution, using phenolphthalein as indicator.—Ibid.

Geranium Oil—Estimation of Free Acid.—According to Jeancard and Satie, the amount of free acid in geranium oil being always considerable, this should be determined in the course of analysis, instead of being calculated into esters and expressed in terms of geranyl acetate, as is usually done. So markedly acid is the oil that the condensers of the distilling apparatus used in its preparation are much attacked, and the hands of the workmen employed in the distillation are blistered. To determine the amount of this free acid 3 Gm. of the oil is weighed off, dissolved in 10 Cc. of alcohol 96 per cent., and 10 Cc. of semi-normal alcoholic potash. After two minutes' contact in the cold the amount of potash used up is titrated after dilution with water, in the usual way. Experiments show that if this time be not exceeded the saponification of the esters is a negligible quantity. The saponification number of the sample is then determined in the usual way, by heating, the amount equivalent to the free acid is deducted, and the difference calculated into terms of geranyl acetate. A series of samples thus examined gave the following figures:

	Sp. gr. at 15°.	Opt. Rot. 100 Mm. at 15°.	Free Acid Number.	Ester Number.	Esters as $C_{12}H_{20}O_2$ p. c.	Alcohols as $C_{10}H_{18}$ p. c.
French geranium oil..	0.8972	—9.40	26.60	54.60	9.80	61.31
Spanish " " ..	0.9073	—7.30	43.40	65.80	7.84	66.23
Corsican " " ..	0.9012	—8.00	40.13	60.20	7.00	68.55
African " " ..	0.9006	—8.06	42.93	65.80	8.08	63.19
Bourbon " " ..	0.8995	—8.20	56.00	74.00	6.65	71.28
Indian " " ..	0.8960	—0.48	9.6	43.00	11.30	84.62

If the total saponification number were calculated, as is usually done, into equivalents of geranyl acetate, these samples would be stated to contain: French, 19.11; Spanish, 23.03; Corsican, 21.07; African, 23.03; Bourbon, 25.95, and Indian, 15.05 per cent. of that ester, results which would appear to be greatly in excess of the truth.—Pharm. Journ., Feb. 17, 1900, 143; from Bull. Soc. Chim., 23, 39.

Otto of Rose—Suggestions Concerning Chemical and Physical Constants.—Henry Garnett observes that the great value of otto of rose and the extent to which, unhappily, its sophistication exists, make the subject of its chemical and physical examination one of immense importance, while the fact that the adulteration is so skillful as practically to elude all ordinary tests makes the analysis of otto of rose of special interest to chemists. It is well known that the chief, if not the only, adulterant is the oil of palma rosa, or "Turkish geranium," an oil derived from a widely different plant, but one which closely approximates in chemical composition to the liquid portion of the otto itself. Its somewhat rank smell renders its presence evident if the percentage is large, but there is no doubt that as much as 5 per cent. will escape detection even by the nose of the "expert." The more important constants that are useful in the determination of the genuineness are: the *specific gravity*, which in the finest otto the author has found to fall within 0.8525 and 0.8575; the *optical rotation*, which, though varying considerably, lies between 2° 15′ and 3° 15′ for samples in other ways satisfactory; the *freezing point*, which the author finds in the purest ottos of Bulgarian origin, ranges from 19.5° to 22° C., but which is liable to be lowered in case the oil is dehydrated. The mere determination of the *percentage of alcohols* (by acetylization) does not afford very useful results, as palma-rosa oil consists largely of the same alcohols. The *determination of stearoptene* affords a further clue to the composition of the otto, but only under identical conditions. The *ester percentage*, however, often affords useful information, as the amount of ester in pure otto is very low, often as low as 3.0 per cent., while in palma-rosa oil it averages about 10.0 per cent. Hence a large percentage of the latter may be detected; low-priced ottos smelling faintly of palma-rosa have been found to contain 4

to 4.5 per cent. of ester (reckoned as geranyl acetate), while the finer ottos vary from 3.0 to 3.5 per cent.—Chem. and Drugg., June 9, 1900, 961.

Otto of Rose—Opportunities for Adulteration.—In a recent Consular Report the opinion is expressed that the system on which the production of otto of rose is carried on in Eastern Roumelia is to a certain degree responsible for the unsatisfactory product supplied. It appears that the peasants and small proprietors, who receive cash advances from the leading merchants in Kazanlyk, Karlovo and other centres, usually distil the oil on their own premises without any effective supervision, and thus have every opportunity of practising adulteration with impunity, the oil of geranium being introduced into the country in sufficient quantities by Jews and gipsies from Adrianople, in spite of the endeavors of the Government to suppress the traffic. A central distilling establishment would be the most effective prevention of systematic adulteration of the otto of rose, but for various reasons is impracticable. The remedy, however, is in the hands of the buyers, who should consistently refuse to purchase adulterated oil under any consideration.—Pharm. Journ., Nov. 11, 1899, 455.

Jasmin Oil—New Constituents.—In continuation of his previous experiments upon the volatile oil of jasmin flowers, O. Hesse reports upon three new constituents which are more important as odorous constituents than the principal components—benzyl- and linalyl-acetate, linalool and benzyl-alcohol, heretofore described. The new constituents are: *Indol* (C_8H_7N), 2.5 per cent.; *Anthranylic acid methylester* ($C_8H_6NO_2$), 0.5 per cent.; and *jasmon* ($C_{11}H_{16}O$), 3 per cent. The two first named also occur in the oil of orange flowers. Jasmon is a light yellow oil, becoming darker by age, and has an extremely intense persistent and agreeable jasmin odor. Its sp. gr. at 15° C. is 0.945; its boiling point 257°–258° C.—Apoth. Ztg., Dec. 23, 1899, 777; from Berichte, 1899, 2611.

Jasmin Oil—Quantitative Determination of Components.—Hesse and Muller have devised a process for the quantitative determination of the components of jasmin oil, basing their method on the results obtained with an artificial mixture of benzyl acetate, benzyl alcohol, linalool and linalyl acetate in known proportions. The process is based upon the behavior of these compounds towards a known 3 per cent. solution of potassium permanganate. This reagent causes the quantitative oxidation of the benzyl alcohol into benzoic acid. Benzyl acetate, on the other hand, is not attacked, while linalool and linalyl acetate are completely decomposed with formation of acetic and carbonic acids, etc. A sample of essential oil of jasmin examined in this way was found to be composed of about 67 per cent. of benzyl acetate, 7.5 per cent. of linalyl acetate, 6 per cent. of benzyl alcohol and 16 per cent. of linalool.—Schimmel's Rep., Oct. 1899, 34; from Berichte (32), 1899, 765.

Otto of Orris—Characters and Advantages Over the Concrete Oil.—J. C. Stead describes "otto of orris" as being a golden yellow oily fluid resembling sweet almond oil in appearance, but much less viscous. It has an extremely persistent sweet fatty smell, and on dilution fully develops the characteristic odor of orris root to several times the extent which a similar quantity of the ordinary "concrete oil" would produce. Its taste, at first bland, has a persistent biting and bitter after-effect. It is miscible in all proportions with ether, 90 per cent. alcohol, chloroform, petroleum ether, and benzene, soluble in about 8 volumes of 70 per cent. alcohol, and to a very small extent in water. Its alcoholic solution is distinctly acid to litmus. It shows the following constants, which are fairly uniform for different batches: Sp. gr. at 15.5° C.—0.9489; official rotation, 100 Mm. —20.25°: treated with alcoholic semi-normal caustic alkali, 100=6.4 KHO; acetylized otto, 100=17.76 KHO; congealing temperature, —5° C.; viscosity compared with almond oil, 34.5: 100 at 20° C. The otto has been in use for some time and gives good satisfaction. Its advantages over the concrete oil are greater odor value, uniformity of odor, and non-liability to deteriorate under the ordinary conditions of storage. – Pharm. Journ., March 17, 1900, 280.

Artificial Violet Oil—Preparation.—Dr. Klimont has obtained a patent on the following process for preparing artificial violet oil: A mixture of equal parts of citral, acetyl-acetone, acetic acid, sodium acetate, and acetic anhydride is heated for twenty-four hours on the water-bath, and is then washed several times with water, and a jet of steam is passed through the mixture until no citral nor acetyl-acetone passes over. The remaining acetyl-pseudoionone is treated in the cold with concentrated mineral acids. The isomerized product is washed with water and alkali and is then steam distilled, when acetylionone passes over. This body possesses a strong aromatic odor, and boils at about 150° C. under a pressure of 10 Mm. By the action of alkali it can be converted into ionone. — Chem. & Drugg., Nov. 18, 1899, 818; from Revue des Prod. Chimiques.

Ionone—Attempts to Prepare it by the Aid of Chlorinated Lime.—Dr. Ziegler communicates the results of attempts made to produce ionone in various ways by the aid of chlorinated lime, three series of experiments having been carried out by him, as follows: (1) In order to determine whether chlorinated lime solution can be substituted for barium hydrate or other alkalies, employed according to a German patent, to produce the same effect, attempts were made to combine 200 grammes each of acetone and citral with 3.6 liters of filtered saturated solution of chlorinated lime. The mixture was shaken at intervals for several days. The reaction was strongly alkaline. The reaction-products obtained were: Ninety grammes of chloroform and 98 grammes of an oil of sp. gr. 0.885, which, when distilled under a pressure of 12 Mm., yielded 30 grammes at 85°–110° C., 65 grammes at 110°–115°, and 3 grammes of resinous residue. The bulk of

this oil consisted of aldehydes, and little, if any, condensation had taken place, thus proving that chlorinated lime cannot be the equivalent of the ordinary alkaline condensing-agent. (2) Two hundred grammes of acetone, 150 grammes of citral, and 300 Cc. of chlorinated-lime solution were boiled for six hours under a reflux condenser. Excess of acetone was removed by washing with water, and from the reaction-product were separated 5 grammes of chloroform, 15 grammes of citral and methylheptenone, and 105 grammes of an oil which proved to be almost entirely aldehydes. (3) Six hundred grammes of acetone, 300 grammes of citral, and 600 Cc. of chlorinated-lime solution were boiled for six hours under a reflux condenser. From this 20 grammes of chloroform, 50 grammes of an oil containing much citral, and 120 grammes consisting almost entirely of citral were obtained. No pseudoionone was found in any case.—Chem. and Drugg., Nov. 18, 1899, 818; from Chem. Ztg., 1899, 956.

Tuberone—The Odorous Principle of Tuberose Flowers.—A. Verley has isolated from the concentrated extract of tuberose pommade a fraction boiling at 167° C. at 15 Mm. pressure, which corresponds to the formula $C_{13}H_{20}O$, and possessing in a marked degree the odor of tuberose, resembling somewhat that of coumarin, but being much softer and more persistent. The author has given the name "tuberone" to this liquid, which has a density of 0.970 at 8° C. From its behavior with phenylhydrazine and with acetic anhydride, it is evidently a ketone, and yielding formaldehyde when oxidized with chromic acid, it probably contains a CH_2 group.—Pharm. Journ., July 22, 1899, 65; from Bull. Soc. Chim. de Paris, *21*, 306.

Basil Oils—Two Different Kinds Produced in Java.—In an annual report of the Botanical Garden in Buitenzorg, Java, an account is given of two kinds of basil oil, the one obtained to the amount of 0.18 to 0.32 per cent. from a large-leaved variety of *Ocimum Basilicum*, called by the natives "Selaisih Mekah," the other, a variety of the same plant, yielding about 0.2 per cent. of oil upon distillation. The first oil has a sp. gr. of 0.90 at 26° C., optical rotation, in 20 Mm. tube, —30°.5 to —36°. It is rich in eugenol, the content varying from 30 to 40 per cent. of the volume, while the non-acid portions yielded an agreeably odorous substance, boiling at 190° C. The second oil had a fennel-like odor, sp. gr. 0.948 at 25° C., boiled for the greater part at 214° to 218° C., and consisted chiefly of methylchavicol, containing also some anetnol.—Schimmel & Co.'s Semi-Ann. Rep., April, 1900, 6.

Chervil Oil — Yield and Composition. — Charabot and Pillet have obtained by distillation of the ripe green fruits of chervil—*Anthriscus cerefolium*, Hoffm.—0.0118 per cent. of a pale yellow essential oil, possessing an anise-like odor, reminding of estragon. On standing for some time, small crystals — probably a paraffin — separate out from the oil, but the

bulk of the oil consists of methyl-chavicol, which was identified by conversion into its isomer, anethol, and by oxidation of the latter into anise-aldehyde.—Schimmel's Rep., Oct., 1899, 14; from Bull. Soc. Chim. iii., *21* (1899), 368.

Cascarilla Oil—Chemical Components.—G. Fendler has determined the characters and chemical components of an authentic specimen of the volatile oil of cascarilla bark — *Croton eluteria*, Benn.—to be as follows: Sp. gr. at 15° C., 0.914; optical solution $[a]_D = -4.81$ at 15° C. It is composed of: Free acid, 2.10 per cent.; eugenol, 0.30 per cent.; terpene, $C_{10}H_{16}$, b. p. 155°–157° C., 10.00 per cent.; left-rotary limonene, 8.80 per cent.; p-cymol, 13.20 per cent.; sesquiterpene, $C_{15}H_{24}$, b. p. 255°–257° C., 10.50 per cent.; sesquiterpene, $C_{15}H_{24}$, b. p. 260°–265°, 33 per cent.; alcohol, $C_{15}H_{23}OH$, b. p. 280°–290° C., 11 per cent.; high boiling oxygenated portion, 10.00 per cent.; resin, 1.10 per cent.

The author has made the important observation that the terpenes and the cymols could be separated from the sesquiterpenes and the higher boiling fractions of the cascarilla oil by repeatedly distilling the latter with absolute alcohol. Upon diluting the alcoholic distillates with water, the terpenes separated in form of oil layers. This method may probably become a useful one for separating the terpenes from the higher boiling fractions in the examination of other volatile oils.—Apoth. Ztg., Sept. 23, 1899, 562; communicated to Soc. Germ. Naturalists and Physicians, Sept. 18, 1899.

Vetiver Oil—Methyl Alcohol, Furfurol and Diacetyl in the Distillation Water.—Schimmel & Co., being now engaged in the direct preparation of vetiver oil, because of the unsatisfactory quality of the distillate from Réunion, have determined the presence of methyl alcohol and furfurol, previously observed by them in the cohobation water of oils of caraway and cloves, also in the distillation water of vetiver oil. They also found diacetyl to be a component, as in the case of the previous oils, but apparently in a somewhat larger proportion than in the first runnings of caraway and clove oil.—Schimmel & Co.'s Semi.-Ann. Rep., April, 1900, 45.

Oil of Camellia Drupifera—Characters.—Pottier has examined the oil extracted from the seeds of *Camellia drupifera*, known by the natives of Tonkin as

Caydeau-So, and used by them as food, as an application to the hair, and as an external remedial agent. The kernels yield from 28 to 35 per cent. of this oil, which is bland, and does not readily become rancid. The author's examination gives the following figures: Sp. gr. at 15° C., 0.980; acidity in terms of oleic acid, 2.876 per 1,000; opt. rot. (200 Mm.) + 1.8; bromine absorption number (of fatty acids), 0.435; iodine absorption number (of fatty acids), 0.680. Twelve Cc. of the oil give a white permanent emulsion with 8 Cc. of lime water: with the same proportion of solution

of ammonia separation takes place. Sulphuric acid gives a brown coloration with Heydenreich's test. It gives no reduction of silver with Becchi's test, nor does it afford any crystals of potassium arachidate. — Pharm. Journ., May 12, 1900, 495; from Nouv. Rem., *16*, 121.

Oil of Chrysanthemum Japonicum—Properties, Yield, &c.—According to G. Perrier, the green leaves of *Chrysanthemum japonicum* yield on distillation about 0.16 per cent. of a greenish volatile oil, the yield being most abundant at the commencement of flowering. It has a peculiar odor, resembling that of mint and chamomile, begins to boil at 160° C., has the sp. gr. 0.932 at 15° C., and its refraction index is 1.4931 at 18° C. It is soluble in 10 parts of 70 per cent. alcohol, deposits a small amount of an amorphous body—probably paraffin—when cooled to —15° C., and at —24° C., it becomes very thick, while on immersion in a mixture of ether and solid carbonic anhydride it is completely solidified. It is acid to litmus, combines partially with bisulphite, and has a saponification index of 8.61. When the alkaline product of saponification is decomposed with hydrochloric acid, a solid acid, resembling angelic acid in odor, is formed. —Pharm. Journ., April 28, 1900, 437; from Bull. Soc. Chim., *23*, 216.

Oil of Saw Palmetto — Apparent Absence in the Dried Fruit.—The occurrence of volatile oil in saw palmetto berries, along with a much larger percentage of fixed oil, was first mentioned by Sherrard in 1894, and since then has been mentioned by others. Oswald Schreiner now describes a volatile oil of saw palmetto berries submitted to him by J. U. Lloyd, who distilled it in 1890 from fresh berries, the yield being 135 Gm. from 25 pounds. This oil as originally obtained had a green color, not due to copper, and the odor of old cheese or œnanthic ether, and it has retained these properties essentially after 10 years standing. Its sp. gr. at 20° C. is 0.8682, and the principal fraction distils over between 145° and 155° C., only about 15 Gm. of residue remaining when fractionation was stopped at 170° C. In afterward corresponding with Prof. Lloyd regarding the yield of oil from the fresh and from the dried berries, the remarkable fact was determined that the dried fruit yielded practically no oil. Two different distillations were made by Prof. Lloyd, each of 25 pound lots of dried berries; in the one, no oily distillate whatever was obtained, whilst in the other a small amount of fatty substance having the characteristic odor of the volatile oil separated from the distillate after standing one day. It appears highly probable that the latter is simply composed of fatty acids.— Pharm. Rev., May, 1900, 217–222.

Wartara Oil—Yield and Characters.—Schimmel & Co. have distilled the volatile oil from a drug received from Bombay under the name of "wartara seeds," which they have identified to be the fruits of *Xanthoxylum alatum*, Roxb., or *X. acanthopodium*, D. C. Pedler and Warden distilled the oil of this fruit in 1888, and found it to boil at 175°–179° C., the greater

part distilling over between 176° and 179° C., the thermometer finally rising to 183°. The sp. gr. was 0.873 at 15.5° C. The product of Messrs Schimmel & Co. approximated 2 per cent. of the fruits employed. It had a perceptible odor like coriander, a sp. gr. of 0.8714; optical rotatation $a_D = +$ 6°31′; saponification number, 27.1; and made a clear solution with an equal volume of 80 per cent. alcohol. Besides a fair quantity of dipentene, the oil was proven to contain d-linalool, a body which has heretofore been exclusively found in coriander oil. Schimmel & Co.'s Semi-Annual Rep., April 1900, 49.

Oil of Wintergreen—Advantages of the Synthetic over the Natural Oil.—A. R. L. Dohme points out that synthetic oil of wintergreen is readily obtained pure and has the advantage over the natural oil in that it is all methyl salicylate, whereas the natural oil only contains from 90 to 95 per cent. of this, the sole active constituent. It is therefore preferable, independent of the question of price, and doubly better on account of the great difference in price. But, as the synthetic oil is made from salicylic acid, which in turn is made from carbolic acid, it is but natural that a poorly made product might contain some carbolic acid. In buying the synthetic oil, therefore, put a drop on bibulous paper, and if after a few moments an odor of carbolic acid is detected, reject the oil; if not, then use it, and feel that you are getting more odor per drop by 6 per cent. than from natural oil and at the same time save fifty per cent. in cost.—Proc. Maryland Pharm. Assoc., 1899, 98.

Methyl Salicylate—Efficiency as an Antiseptic Dressing.—Gallois has found that the local application of methyl salicylate is a most effectual method of treatment for furunculosis, ulcerated legs, and contused wounds. A few drops of the liquid are applied directly to the affected part, which is then covered with a linen bandage and gutta percha. The first application gives rise to a little discomfort, but subsequent dressings are painless.—Pharm. Journ., Feb. 24, 1900, 183; from Bull. gen. de Therap., *128*, 657.

Oleo Resins—Analytical Values of Various Sorts.—Dr. Karl Dieterich has determined the analytical values of a large number of different oleo resins and of their commercial varieties, with results from which the following table is constructed:

	Acid Number.	Ester Number.	Saponification Number.
Anime, East Indian	29.69	29.77	59.46
Anime, East Indian	30.64	38.67	69.31
Anime, West Indian	45.36	113.93	159.29
Anime, West Indian	47.20	102.39	149.59
Carauna resin	79.37	110.48	189.85
Carauna resin	79.37	111.84	191.21
Damnar	20 to 30	—	—
Dammar with 25 per cent. Colophonium	56 to 59	—	—
Dammar with 50 per cent. Colophonium	97 to 98	—	—
Mastic, Bombay	137.60	—	—
Mastic, Bombay	103.89	—	—
Mastic, Levantine	65.99	—	—
Mastic, Turkish	90.56	—	—
Labdanum, French Commercial	91.78	120.26	212.04
Labdanum, French Commercial	98.36	109.88	208.24
Res. Labdani, German Commercial	54.69	161.95	216.64
Res. Labdani, German Commercial	54.01	116.18	220.10
Labdanum, from Candia	114.80	87.98	202.78
Labdanum, in leaves, very impure	14.06	47.64	61.70
Sandarac, Mogador	160.06	—	—
Sandarac, Mogador	157.95	—	—
Sandarac, Mogador	143.91	—	—
Sandarac, Morocco	174.10	—	—
Sandarac, Australian	139.00	—	—
Sandarac, Australian, fine, select	129.87	—	—
Sandarac, Australian, second	144.61	—	—
Sandarac, Australian, ordinary	155.84	—	—
Sandarac, Asia Minor	179.01	—	—
Tacamahac, Bourbon	38.10	68.22	106.32
Tacamahac, West Indian	28.40	68.43	96.83
Tacamahac, West Indian	20.39	77.33	97.72
Tacamahac, East Indian	32.99	38.81	71.86
Tacamahac, East Indian	21.41	32.67	54.08
Tacamahac, East Indian	22.20	60.90	83.10
Turpeth resin	20.73	139.98	160.71
Turpeth resin	24.45	137.27	161.72
Turpeth resin	22.93	141.01	163.94
Turpeth resin	20.50	139.99	160.49

—Pharm. Centralh., 1899, 453.

Amber—Distinction from Copal.—In order to determine whether some amber trinkets found by Schliemann at Troy and Mycenæ were really true amber and not, as was suggested, fossil copal of African origin brought to Troy by the Egyptians and Phœnicians, Roessler subjected them to a simple test, based on the fact that amber contains sulphur, whereas copal does not. A minute particle was placed in a test-tube, and heated until fumes were given off. On allowing the fumes to come into contact with a piece of moistened lead acetate paper the characteristic black color was given, thus proving the trinkets to be of true amber. With copal no such color is obtained.—Pharm. Journ., March 17, 1900, 277; from Journ. Pharm. Chim. (6) *11*, 113.

Amber—Method of Cementing Fractures.—The "Petit Mon. Pharm." (*49*, 3315) recommends the following method of mending broken amber: Moisten the fractured surfaces with solution of caustic potash; join them together, and hold them for a few minutes over a charcoal fire, then cool. When the joint has been well done, it is imperceptible.

Resinolic Acid Group of Resins—Chemical Examination.—Prof. Tschirch read a comprehensive paper before the Conference of German Naturalists and Physicians (Sept. 19, 1809), in which he gives the results of the chemical examination of the resins belonging to the resinolic acid group, undertaken in conjunction with Weigel, Aschau and Brüning. The resins belonging to this group are derived from two families of plants, the *Coniferæ* and the *Cæsalpinoideæ*. Of those belonging to the *Coniferæ*, the resins of *Pinus palustris*, *Pinus silvestris*, *Picea vulgaris*, *Dammara alba*, *Abies pectinata*, *Abies canadensis*, *Larix decidua* and *Callistris quadrivalis* were examined, the following method being employed: The resins were dissolved in ether, the solution shaken out first with weak ammonium carbonate solution, then fractionally shaken out with 1 per cent. soda solution, and the resultant solution precipitated with hydrochloric acid. The acids were separated from the resin-acid mixture so obtained by three methods: by solution in dilute potassa and precipitation with caustic potassa in substance; by solution in ammonia, and by fractional extraction with glacial acetic acid. Recrystallization of the resin acids was mainly effected by means of methyl alcohol. The original ether solution of the resins, after complete exhaustion with soda, was shaken out with dilute potash solution, and then distilled with water to remove the volatile oil. The residue is resin. In all cases the natural resins yielded a number of resin-acids, both handsomely crystallized and amorphous. In this manner the author has been able to divide the coniferous resins into a number of sub-groups, differing from each other in various ways, though the investigations do not appear to have been carried out to a finality. To the resins of the *Cæsalpinoideæ* belong both Zanzibar copal and the copaibas. The latter were treated as follows: The copaiba was dissolved in ether and shaken out with 5 per cent. soda solution. The ether retains the volatile oil and resin, which are separable from each other by distillation with steam. The soda solutions were precipitated with hydrochloric acid, the precipitates were dissolved in ether, and the ether solutions shaken out with water, which removed the bitter principles contained in the samples. The ether solution was then shaken out with ammonium carbonate, then with 5 per cent. soda solution, and from these solutions the resin-acids precipitated with hydrochloric acid. By conversion into lead salts by means of basic lead acetate solution in glacial acetic acid, etc., the author eventually obtained five distinct resin-acids, four of which were crystalline and one amorphous. In this way four sorts of copaiba, viz., Para, Maracaibo, African and Illurin, were examined, and found to differ, not alone between

each other, but also in samples of the same designation, this being particularly the case with Maracaibo copaibas.—Apoth. Ztg., Sept. 27, 1899, 572.

Euphorbon—Properties. — A. Orlow has extracted euphorbon from euphorbium by means of petroleum ether, and attributes to it the formula $C_{15}H_{24}O$. Crystallized from petroleum ether, euphorbon melts at 67° C., when crystallized from ice-cold alcohol at 91° C., and if the latter be recrystallized from alcohol the melting point is raised to 114° C. They retain one molecule of alcohol. The author has studied the derivatives of euphorbon obtained by the action of the halogens — chlorine, iodine, and bromine — and of fuming nitric acid, the latter producing a yellow acid containing nitrogen, which dissolves in alkali with a red color. A water-soluble body similar to an amide is produced by treating euphorbon with zinc dust in acetic acid and alcohol.—Chem. Ztg., Rep. *23*, 174.

ALCOHOLS AND DERIVATIVES.

Alcohol—Removal of Acetoneoil Added for the Purpose of Denaturation. —According to the experiments of R. Dumechin, the denaturation of ethyl alcohol by means of acetoneoil (methylethylketone) as proposed by A. and P. Buisine (see Proceedings, 1899) is not effective, since it is quite possible to recover the alcohol in a pure condition almost completely by the following method: 500 Cc. of 95 per cent. alcohol, containing 10 Cc. methylethylketone, are mixed with 20 Gm. of caustic lime in the form of about 500 Cc. of milk of lime and with a quantity of chlorinated lime corresponding to 50 Gm. chloride. After standing about two hours in the cold, the mixture is filtered and rectified by distillation. In this way 15 Cc. of chloroform and 475 Cc. of alcohol of 95 per cent. were obtained, the alcohol being perfectly free from acetone and without the least foreign taste or odor.—Apoth. Ztg., July 19, 1899, 428; from Bull. Soc. Chim. de Paris (3) *21*, 314–315.

Aldehyde—Detection in Ether.—Hermann Blaser, having experienced difficulty to completely decolorize the fuchsine-sulphurous acid reagent commonly employed for the detection of aldehyde in ether, conceived the idea of effecting the decolorization of fuchsine in very dilute solution by exposure to sunlight. He finds that this is readily accomplished with any kind of fuchsine in solutions attenuated to 1 : 100,000, and without the intervention of sulphurous acid, and that the reagent so produced instantly produces a red color when added to ether containing paraldehyde—aldehyde not being available to the author—in the proportion of 1 drop to 5 Cc.—Pharm. Centralh., Oct. 5, 1899, 607.

Acetone Dicarbonic Acid—Formation and Composition.—G. Denigés' test for the presence of citrates, which depends on the formation of an insoluble precipitate with mercuric sulphate in excess after the oxidation of the citrates with permanganate, is, according to that authority, due to the

production of acetone dicarbonic acid—$HO.OC.CH_2.CO.CH_2.CO.OH$. The composition of the insoluble mercury compound is $HgSO_4,2HgO,2(C_5H_4O_5.Hg)$.—Pharm. Journ., Aug. 5, 1899, 139; from Bull. Soc. de Pharm. de Bordeaux, *39*, 97.

Ethyl Nitrite Preparations of the B. P. — Loss of Strength and Prevention.—John Barclay relates the following experience and experiments with official (B. P.) ethyl nitrite preparations: In December, 1898, four 20-oz. stoppered bottles, filled respectively with (A) solution of ethyl nitrite, (B) spirit of nitrous ether with 10 Gm. of bicarbonate of soda, (C) spirit of nitrous ether, (D) spirit of nitrous ether, were put aside for periodical examination of strength. Bottle D was placed in a cool, dark cellar. On each successive day for sixty days, 5 Cc. of liquid was removed from each of the bottles A, B, and C, and the strength ascertained by the official process. During the whole of the sixty days the bottles were kept on the laboratory shelves, the conditions being similar to those at the dispensing-counter. The results, in terms of volumes of nitric-oxide gas yielded by 100 Cc. of the liquids, were as follows:

	A	B	C
December 14, 1st day	929.2	789.8	789.8
December 24, 10th day	862.3	743.2	721.9
January 3, 20th day	859.18	702.6	658.3
January 13, 30th day	843.9	656.3	597.9
January 23, 40th day	814.2	619.6	541.2
February 2, 50th day	804	563	498.1
February 12, 60th day	796	475.3	416.6

The sample D, originally of the same strength as B and C, was found at the end of sixty days' storage in a cool, dark cellar to have a strength corresponding to a yield of 730 Cc. per cent. of nitric-oxide gas, from which it appears (1) that the liq. ethyl. nit. keeps well, (2) that spt. æther. nit. in sixty days falls below the minimum B. P. requirements, (3) that a small quantity of alkaline carbonate slightly retards loss of strength, and (4) that spt. æther. nit. kept in full bottles in a cool, dark place diminishes little in strength.—Chem. News, Dec. 23, 1899, 1030.

Ethyl Nitrite—Assay by a Modification of Eykman's Process.—David L. Davoll, Jr. says that while the U. S P. process for the assay of spirit of nitrous ether is generally regarded as being rapid, reliable and reasonably accurate, he has not found such to be the case. He reviews the various methods that have been proposed from time to time, and finds the volumetric method of Eykman, under the following modification, to give the most satisfactory results: 3.9239 Gm. of ferrous ammonium sulphate is placed in an Erlenmeyer flask of about 100 Cc. capacity; 20 Cc of sulphuric acid (1 : 5) is then added, together with 25 Cc. of distilled water; agitate the solution; 2 Gm. of crystallized sodium carbonate is then quickly added, while a sound, well-fitting cork is loosely held in the neck,

and, after effervescence ceases, is slipped into place. The cork being now partially removed, 5 Cc. of spirit of nitrous ether is allowed to run in, the cork replaced tightly, the flask rotated once and set aside for an hour, or, better, over night. The stopper being now drawn and lightly resting in the neck, the flask-contents are rapidly brought to the boiling point and boiled for six minutes; the sides are washed down with distilled water, the flask and contents are cooled quickly under the water supply, and the excess of ferrous salt titrated back with standard permanganate, preferably semi-normal. The 3.9239 Gm. of ferrous ammonium sulphate used is equivalent to 20 Cc. of semi-normal standard solution of permanganate. The calculation of results by this method is as follows, when 5 Cc. of spirit of nitrous ether are taken:

$$\frac{20 \text{ Cc.} - \text{Cc. (semi-norm. permang. required)} \times 0.0375}{5 \text{ Cc.} \times \text{specific gravity.}} = \text{per cent.}$$

—Proc. Ill. Pharm. Assoc., 1899, 64–70.

Ethyl Nitrite—Convenient and Delicate Colorimetric Method of Estimation.—R. C. Cowley and J. P. Catford propose a convenient and delicate method for estimating ethyl nitrite in spirit of nitrous ether, which is an adaptation of one of the colorimetric processes for determining nitrites in water analysis, founded on the reaction between nitrous acid and meta-phenylene diamine, producing the azo-compound commonly known as "Bismarck-brown." This color is permanent, and so intense that one part in five million is perceptible, so that differences of $\frac{1}{100}$ of a milligram in 50.0 Cc. of water are distinguishable. For the purpose of the test under consideration, however, a few tenths of a milligram in 40.0 Cc. will amply suffice for comparison. Where extreme delicacy is required, the standard nitrite solution has heretofore usually been prepared from silver nitrite; but sodium nitrite is now obtainable in the market so nearly pure that it rarely contains less than 98 per cent. of nitrite, and the limit of error is therefore so small as to be safely disregarded. Moreover, an allowance for impurity by increasing the quantity of commercial sodium nitrite in the standard nitrite solution from 92 milligrams per liter to 95 milligrams, the equivalent weights of the several nitrites being: ethyl nitrite, 75 (or 100); silver nitrite, 154 (or 205.3), and sodium nitrite, 69 (or 92). The following solutions and dilutions are required:

1. *Standard* sodium nitrite solution, 0.095 in 1000 of water.

2. *Test Solutions: a.* Meta-phenylene-diamine, 2 grains in ℥j water; *b.* Sulphuric acid, 1 vol. to 2 vols. water.

3. *Color Standards:* Corresponding to 1, 2 and 3 per cent. ethyl nitrite, prepared by adding 1, 2 or 3 Cc. of the standard sodium nitrite solution (1) to separate portions of water, each containing 10 drops each of test solution *a* and *b* (2) and make up to 40 Cc. These are kept as comparison standards, and the standard sodium nitrite solution (1) may thereafter be practically dispensed with.

4. *Dilution of Samples:* 1 Cc. of spirit of nitrous ether to 84.0 Cc. with water (= 1 centigram in each Cc.)

5. *Application of Test:* Add 1 Cc. of the diluted sample (4) to water containing test solutions as under (3), and make up to 40 Cc. After standing 1 hour, match with the color standards (3) by further diluting the sample if necessary. Thus, if the color intensity is between the 3 and 2 Cc. color standards, the sample contains between 3 and 2 per cent. of ethyl nitrite; if below 2 Cc., it is diluted until it matches in color the 1 Cc. color standard; and if this latter dilution does not fall below a total of 70 Cc. from 40 Cc. it is within the B. P. minimum of strength, viz.: 1.5 per cent. ethyl nitrite. (The application of the method to the U. S. P. spirit is obvious.—Rep.)

The color comparisons are best made by the aid of Nessler cylinders; but if these are not at hand, comparisons may be made with test tubes having uniformly the same calibre, or even with vials of white glass. It is essential that the columns of liquid should not alone be of equal diameter, but also in height, since the paler colors require comparison from above. —Pharm. Journ., Nov. 18, 1899, 471–472.

Chloral Hydrate—Modification of B. P. Test.—The B. P. test for the determination of chloral hydrate requires that, "If 4 grammes be treated with 30 Cc. of volumetric solution of sodium hydroxide, no more than 6 Cc. of volumetric solution of sulphuric acid should be required to neutralize the soda which remains free on the completion of the reaction." Experimenting according to these official directions, F. H. Alcock and T. H. Thomas obtained results which, if accepted as correct, would indicate considerably more than 100 per cent. pure chloral hydrate. Further experiments showed that if the reaction is prolonged the deviation is still greater, and that this deviation is due to a reaction between the chloroform produced and the caustic alkali, sodium chloride and formate being produced with decomposition of the chloroform. Concordant results can, however, be obtained if the test is conducted expeditiously, as follows: Mix 4 grammes of chloral hydrate in a stoppered bottle with 30 Cc. of sodium hydroxide solution, shake vigorously for a few minutes, without the use of heat, and then add the acid, using litmus as indicator. In this way the authors found 5.8 Cc. of acid necessary for complete neutralization.—Pharm. Journ., Sept. 9, 1899, 236.

In a paper on the same subject F. Pilkington Sargeant records similar difficulties experienced with the official test of the B. P. known as Meyer's process, and concludes from his experiment that the process is not suitable for determining the amount of chloral hydrate in a solution, that the chloral hydrate should be added direct to the alkali, and not previously dissolved, and that secondary reactions take place in inverse proportion to the amount of chloral hydrate and excess of alkali present, and in direct proportion to the heat applied.—Ibid, 236.

Chloral Hydrate—Forensic Determination. — Dr. Russwurm finds that chloral hydrate is with difficulty volatilized completely on distilling the contents of the stomach in forensic examinations. The complete determination is therefore best effected by the aid of distillation with alkali, which converts the chloral into chloroform. The chloroform is then estimated in the distillate as chlorine after dilution to a definite volume, a well known method, which consists in boiling the liquid with alcoholic potassa under a reflux cendenser, neutralizing the product of the reaction, and titrating with $\frac{N}{10}$ silver nitrate.—Pharm. Centralh. Sept. 7, 1899, 543.

Chloroform—Electrolytic Process of Preparation.—L. Lambellati has successfully prepared chloroform by electrolysis from sodium chloride and acetone as follows: A 20 per cent. solution of sodium chloride is introduced into a leaden still heated with steam and provided with a carbon stirring apparatus which serves as anode for an electric current of 5 to 6 amperes; when the temperature of 100° C. is attained, acetone is introduced through the bottom of the still. The electric current decomposes the sodium chloride with formation of sodium hydrate and liberation of chlorine; the chlorine converts the acetone into trichloracetone, and this in turn is decomposed by the sodium hydrate with formation of chloroform and sodium acetate: $CH_3.CO.CCl_3 + NaOH = CH_3.CO.ONa + CHCl_3$. The chloroform is condensed in its passage from the still through a condenser in the usual manner, the yield being 180 parts from 100 parts of acetone, while theoretically 210 parts should be obtained.—Apoth. Ztg., Nov. 25, 1899, 712; from L'Electricita, 1899, 664.

Chloroform—Rectification and Preservation.—V. Masson states that the rectification of chloroform comprises the following operations: (1) Washing with distilled water; (2) treatment with 2.5 per cent. sulphuric acid for two or three days; (3) treatment with 3 per cent. soda-lye for three or four days; (4) washing with distilled water; (5) treatment with pure melted coarsely-powdered calcium chloride; this should be agitated for three or four hours, and poppy-seed oil then added; (6) distillation. Poppy-seed oil possesses to a very high degree the property of preventing the decomposition of chloroform—one-thousandth part of the oil being sufficient to prevent any alteration of the chloroform when exposed to direct solar radiation, while the addition of two-thousandths of poppy-seed oil has kept chloroform intact for three years.—Chem. News, Oct. 13, 1899, 183; from Journ. de Pharm. (6) ix, No. 12.

Fig. 79.

Chloroform—Test Bottle.—On Dr. Baetcke's recommendation the little shaking-flask (Fig. 79) for testing chloroform according to the Ph. Germ. has been constructed by Warmbrunn, Quilitz & Co., Berlin, but it is so

simple that it may be readily constructed by the pharmacist. The flask is provided with two engraved rings, the one indicating the volume 15 Cc., the other 35 Cc. By their aid the sulphuric acid and chloroform may be expeditiously and conveniently measured out in the required pharmacopœial quantities.—Apoth. Ztg., Nov. 11, 1899, 678.

Bromoform—Estimation in Toxicology.—A. Richaud observes that bromoform may be collected almost integrally in the presence of organic matter by entanglement with a current of steam, in presence of water not exceeding 75 to 100 Cc. It then suffices to add a few fragments of potash, to fit the flask with a vertical refrigerator, and to heat gently for an hour or an hour and a half to completely transform the bromoform into bromide.—Chem. News, Aug. 18, 1899, 83; from Journ. de Pharm. (6), ix, No. 5.

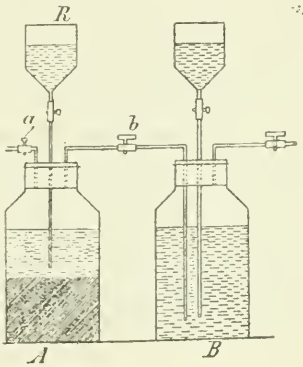
Iodoform—Industrial Production.—Dr. M. Otto produces iodoform industrially, direct from alkaline iodides, as follows: 100 kg. of water, 300 kg. of alcohol, 10 kg. of sodium carbonate and 55 kg. of potassium iodide are heated to 50° C. in a suitable vessel, and a current of ozone is passed through the mixture. Iodoform is deposited and crystallizes in a pure condition on the sides of the vessel and throughout the fluid itself. The alcohol may be replaced by acetaldehyde, acetone, etc.—Apoth. Ztg., March 10, 1900, 166: from Chem. Ztg., 1900, 197.

Iodoform—Detection of Small Quantities.—G. Deniges found that by heating an ammonia compound of the aromatic series with iodoform, a salt of rosaniline is formed, the intense color of which enables the detection of mere traces of iodoform. By trial of a large number of aromatic ammonia compounds, he obtained better results with the substituted amines in amidogen than when the substitution took place in the nucleus. In practice two cases may present themselves: 1. The iodoform may be separated by ether from the substances with which it is mixed; 2. The iodoform may be in a solvent miscible with ether, and therefore cannot be isolated by its help. In the first case the ether is evaporated in a crucible, and 3 or 4 drops of dimethylamine, which was found to give the best results, added; if there is even only a trace of iodoform present, the mixture immediately takes a very distinct yellow color. The liquid thus obtained is placed in a small test-tube, and heated nearly to boiling for a few moments only; on cooling, a little alcohol is added, and a liquid is obtained which appears red by transmitted and violet by reflected light if much iodoform is present, and violet only when there is only a small quantity of iodoform. In the second case 4 or 5 drops of the material—iodoformed guaïacol, for instance—are put in a tube with an equal quantity of dimethylamine, the mixture takes a yellow color, the intensity of which is in proportion to the quantity of iodoform present; on carefully heating the mixture and diluting with alcohol the violet color is produced.—Chem. News, Jan. 19, 1900, 35; from Bull. Soc. Pharm. de Bordeaux, Nov. 1899.

Iodoform—Vinegar as a Deodorant.—It is stated in "Pharm. Post" (Dec. 10, 1899, 692), that if, after washing the hands or utensils with soap, they are rubbed thoroughly with vinegar, the odor of iodoform is easily removed.

Fluoroform—Preparation of the Pure Gas.—Valentiner and Schwarz have patented a process (in Germany) for the preparation of pure fluoroform, which has recently come into demand—in form of fluoroform water—for the treatment of tuberculosis. The process is dependent on the reaction between iodoform and silver fluoride in the presence of water, and is carried out by means of the apparatus shown by Fig. 80, as follows: The generator *A* is charged with alternate layers of iodoform and silver fluoride, a layer of sand being interposed between them, until it is filled to one-half its capacity; it is then filled with water so that the air may be completely removed, the cocks, *a* and *b*, are closed, and that communicating with the vessel, *R*, is opened. As soon as the water penetrates to the first iodoform layer, fluoroform begins to be generated; it accumulates in the upper part of the generator and forces a corresponding volume of the water into the vessel, *R*. When sufficient gas-pressure has been produced in this way, the cock, *b*, is opened. This communicates with the washer, *B*, which is completely filled with solution of cuprous chloride, the cock leading further on from this being also closed. The fluoroform now passes from *A* to *B* and passing through the solution forces a portion of it into the vessel above. When sufficient pressure is thus produced, the partly washed fluoroform is passed into a second washer, containing pure water, but otherwise a duplicate of the first. In this it receives its final washing, and passes pure into the gasometer provided for the purpose. The process goes on regularly and evenly to the end.—Pharm. Ztg., Jan. 3, 1900, 8.

Fig. 80.



Cyanoform and Nitroform—Formation and Characters.—Hantzsch, Ostwald and Rinckenberger have investigated the highly interesting cyano- and nitro-compounds corresponding to bromoform, chloroform and iodoform.

Cyanoform $HC(CN_3)$, prepared from the di-sodium salt of methylene cyanide, by acidification and treatment with ether, is, like nitroform, a very powerful monobasic acid. It is only stable in the pure state, or in a solvent free from water, as it polymerizes very readily. In watery solution and in salts, this acid exists only as isocyanoform.

Nitroform, $H.C(NO_2)_3$, is obtained through treatment of potassium nitroform with strong sulphuric acid, as a colorless mass, melting at 15°C. The watery solution of this, as well as its salts, is colored a deep yellow, owing to the formation of iso-compounds.—Pharm. Journ., Jan. 13, 1900, 21; from Berichte, *32*, 628.

Oleum Ætheream—Commercially an Ambiguous Product.—Lyman F. Kebler points out that heavy oil of wine as found in commerce is an exceedingly variable product, no two specimens being alike, and not even identical as produced by the manufacturer at different times. Prepared under the direction of the U. S. P., it is described as consisting of equal measures of heavy oil of wine and ether, having a stated specific gravity, and distilling between 150° and 160° C. The general experience of all operators has been that a little variation of temperature may cause a variation of as much or more than 300 per cent. in the ultimate yield. If it is furthermore considered that the yield at best is a small one—not more than an ounce from two-thirds of a gallon of alcohol—the low prices at which it is generally quoted seem to justify the conclusion that the commercial products, except in isolated instances, have a common source—namely, the residue in the manufacture of ether. The variations in the characters of commercial heavy oil of wine are shown in the following table, showing the results of examinations of seven commercial samples, and fully representing the article available in the United States:

No.	Sp. gr. at 15° C.	Reaction.	Boiling Point.
1	0.9053	Acid.	Began at 221° rose gradually to 270° C.
2	0.9000	"	Began at 235° rose gradually to 285° C.
3	0.9008	"	Began at 35°(1) rose to 150° C. and carbonized.
4	0.8922	Neutral.	Began at 90° rose gradually to 275° C.
5	0.8941	"	Began at 154° rose gradually to 285° C.
6	0.9020	Acid.	Began at 241° rose gradually to 278° C.
7	0.8971	"	Began at 170° rose gradually to 276° C.

[1] This article was sent for heavy oil of wine.

—Amer. Drugg., Jan. 16, 1900, 33.

Referring to Mr. Kebler's paper, Prof. Wilbur L. Scoville makes some additional remarks concerning the variability and preparation of ethereal oil. Experiments made a year ago by students of the Massachusetts College of Pharmacy appear to show that under proper and careful conditions considerably larger yields than those generally accepted can be obtained. In two instances, after several trials, different operators obtained 10 Cc. of ethereal oil (= 20 Cc. of the official diluted oil) from 1000 Cc. of alcohol (equal to 2½ fl. ozs. per gallon). The products were, however, evidently of variable composition, the one darkening considerably after a year's

standing, while the other remained light and shows no evidence of change at the present time. A still better yield was obtained in 1890 by J. A. Eveleth, namely, 17 Cc. of official oil from 644 Cc. of alcohol, which is equal to 3½ fl. ozs. per gallon. This operator, however, used a 96 per cent. sulphuric acid instead of the official 92.5 per cent. Prof. Scoville, furthermore, suggests a possible means of standardizing ethereal oil and the spirit made from it, which is based upon the observation of Mr. Eveleth that when ethereal oil is evaporated with an aqueous solution of barium chloride, an insoluble residue of barium sulphate is obtained, which is constant in quantity for the same oil. When this method was applied to two samples of compound spirit of ether made with true ethereal oil, the quantities of barium sulphate yielded by 10 Cc. were 0.0372 and 0.0122 Gm., respectively.—*Ibid.*, Feb. 10, 1900, 65.

Methyl Alcohol—Occurrence in Various Plants.—P. van Romburgh, leaving out of consideration the occurrence of methyl salicylate in a large number of plants, has observed the occurrence of methyl alcohol, as such, in the following: *Thea chinensis*, *Erythroxylon coca*, *Indigofera disperma*, *Indigofera galegoides*, *Bœhmeria nivea*, *Vilex tiliifolia*, *Ageratum conyzoides* and *Cæsalpinia sappan*. The presence of methyl alcohol in the fruits of various umbelliferæ had been noted already in 1875; van Romburgh's observations were made with material growing in the Botanical Gardens at Buitenzorg, Java. The methyl ester of cinnamic acid was found in the rhizomes of *Alpinia malaccensis*.—Apoth. Ztg., Aug. 2, 1899, 459; from Annal. du Jardin de Botan. do Buitenzorg, vol. *T.*, 1899, —.

Wood Naphtha—Official Tests of Quality Required by the British Revenue Commission.—According to a recent notice issued by the Commissioners of Inland Revenue, all wood naphtha that is to be used for methylating purposes must respond to certain qualifications and tests which, as given in detail in "Pharm. Journ." (Aug. 12, 1899, 173–174), are briefly as follows: All wood naphtha submitted for approval must consist entirely of substances derived from the destructive distillation of wood. It must also be so impure as to make nine times its volume of spirit of wine sufficiently nauseous to be rendered incapable of being used as a beverage, or of being mixed with potable spirits of any kind without rendering them unfit for human consumption. Not more than 30 Cc. of the wood naphtha must be required to decolorize a solution containing 0.5 Gm. of bromine; it must also be neutral or only slightly alkaline to litmus, and require at least 5 Cc. of decinormal acid to neutralize 25 Cc. of the spirit when methyl orange is used as the indicator. No wood naphtha will be approved which contains (*a*) less than 72 per cent. by volume of methyl alcohol; (*b*) more than 12 Gm. per 100 Cc. of acetone, aldehydes, and higher ketones, determined as "acetone" by the formation of iodoform according to Messinger's method; (*c*) more than 3 Gm. per 100 Cc. of esters determined as methyl acetate by hydrolysis.

Formaldehyde—Detection and Determination.—C. Neuberg finds paradihydrazinediphenyl an excellent reagent for the qualitative and quantitative determination of formaldehyde. Aqueous solutions of the chlorhydrate of this hydrazine base give with formaldehyde in dilute solutions a flocculent yellow precipitate, which is immediate when warmed to 50°–60° C., and forms fine crystals when allowed to separate slowly. The hydrazone so formed is characterized by insolubility in aliphatic alcohols, benzene, ether, chloroform and other organic solvents. The crystals melt at 220° C., but the melting point is wanting in sharpness. Formaldehyde solutions 1 : 5000, when warmed with a few drops of the reagent, are colored momentarily yellow until the separation of the crystalline precipitate. In dilutions 1 : 8000 the test is unreliable. Should other aldehydes or ketones be present, double the volume of alcohol is added, which holds the compounds produced by them with the reagent in solution.—Pharm. Review, Oct. 1899, 463; from Ber. d. D. Ch. Ges., *32*, 1961.

Formaldehyde—Comparison of Tests.—B. M. Pilhashy finds that the published tests for formaldehyde are in some instances not as delicate as is claimed, while in others the reactions are shared by other aldehydes. He regards phenylhydrazine hydrochloride as being the best reagent, and finds that when it is used in conjunction with sodium nitroprusside and concentrated solution of sodium hydroxide it is capable of indicating the presence of 1 part of formaldehyde in 1 million parts. He finds that Schiff's reagent—fuschine decolorized by sulphurous acid—is not alone affected by most aldehydes, but that similar results are obtained by simply exposing the reagent to the air, or by warming the suspected liquid with it in the absence of an aldehyde. Phenol with sulphuric acid gives a reaction with most aldehydes, as does also diazobenzene sulphonic acid. Nessler's Reagent reacts with both acetaldehyde and formaldehyde; Trillat's Reagent (dimethylaniline and sulphuric acid) does not show the presence of formaldehyde, while Lebbin's Reagent (resorcinol with sodium hydroxide) is not near as delicate as is claimed, detecting only 1 part of formaldehyde in 200,000 and not 1 in 10,000,000 parts. Finally, morphine hydrochloride with sulphuric acid is not sensitive enough to detect formaldehyde in a solution containing less than 1 part in 1000.—Journ. Amer. Chem. Soc., 1900, 22, 132.

Formaldehyde—Use as a Preservative of Medicinal Preparations?—W. P. Clark has experimented on the efficiency of formaldehyde as a preservative of medicinal preparations, and found it quite effective. As an example, mucilage of acacia, made in 1898, to which one fifth of one per cent. of formalin-Schering had been added, has been in use for pasting since then and seems now to be absolutely unchanged. The question of admitting or prohibiting its use for the purpose of preserving medicinal preparations he does not venture to decide. Submitting the question to a careful and skilled physician, who uses formaldehyde extensively in his

practice, he was informed that in quantities not exeeeding one-half of one per cent. its presence was (in the opinion of the physician) not objectionable on therapeutic grounds.—Proc. Wisc. Pharm. Assoc., 1899, 33.

Formaldehyde—Preservative Effect on Various Pharmaceutical Preparations.—Under the provision that the addition of formaldehyde may not be found injurious or objectionable, John E. Groff reports on a large number of pharmaceutical preparations which under ordinary conditions of preservation are subject to form mold or to undergo other changes, but which have kept perfectly after the addition of one-half of one per cent. of the formaldehyde solutions marketed by various reputable manufacturers. The preparations include the official waters, syrups of hypophosphites and of tar, distilled extract of witch hazel, solutions of the scale salts of iron, of the haloid salts of the alkaloids, of magnesium sulphate, and of the mucilages of acacia and of quince seed.—Merck's Rep., April, 1900, 145.

Formaldehyde.—Use for determining the presence of *Gelatin* in *Gum Arabic*, which see.

Formaldehyde.—Untoward effects when used as a preservative of *milk*, which see under "Albuminoids."

Formaldehyde—Fatal Case of Poisoning.—The "Medical Press" points out that the formaldehyde solutions usually employed for germicidal purposes are usually quite strong enough to cause harmful and even fatal effects. A case is recorded of a young man who drank two ounces of a four (4) per cent. solution of formaldehyde, which was used for treating seed potatoes. The immediate effect was to cause vomiting of matter containing traces of blood, and death occurred about twenty-nine hours afterwards, as the result of heart failure. A post-mortem examination showed that the œsophagus was slightly inflamed, and escharotic changes were visible in the stomach.—Pharm. Journ., Sep. 23, 1899, 295.

Cacodylic Acid—Character and Uses.—Armand Gautier recommends cacodylic acid in form of sodium or calcium salt for medicinal exhibition. These salts may be given in doses corresponding to 0.05 to 0.15 Gm. of the pure acid, which are best administered subcutaneously. Pure cacodylic acid, $As(CH_3)_2O_2H$, forms white, odorless crystals, possessing a barely acid taste. When pure and dry 100 parts require exactly 28.99 parts of sodium hydrate for saturation. On adding lime-water to the solutions of the acid or its salts no precipitates should be produced, proving the absence of oxalates, arsenites and arsenates. The sodium salt should give no precipitate with silver nitrate or at most only faint turbidity, nor should its solution afford a precipitate with magnesium mixture. A solution containing 0.05 Gm. cacodylic acid in 1 Cc. is obtained by dissolving 6.4 Gm of the sodium salt by boiling with 100 Cc. of water and 10 drops of phenylic spirit (? Rep.) for some time, restoring the evaporated water to

100 Cc., and preserving the solution in sterilized vials.—Apoth. Ztg., Dec. 23, 1899, 776; from Les Nouv. Rem.

Cacodylic Acid—Medicinal Use and Value.—Podalowski and Prochorow recommend cacodylic acid (dimethylarsenic acid, $AsO_2H(CH_3)_2$ as a relatively little poisonous (?) arsenic compound, which may be given in relatively large doses, and has proven useful in cases of tuberculosis, anæmia, diabetes, etc.—Pharm. Post, Aug. 27, 1899, 467.

Sodium Cacodylate—Pharmaceutical Uses.—Danlos describes a number of pharmaceutical preparations of sodium cacodylate, which is used medicinally both in hypodermic injection, in doses of 2 to 5 centigrammes, and internally in doses of 10 centigrammes.

Sodium Cacodylate Mixture is made by dissolving 2 Gm. of the salt in 60 Gm. of distilled water and adding 20 Gm. each of rum and simple syrup, and 2 drops of oil of peppermint.

Sodium Cacodylate Pills are made to contain 10 centigrammes each, massed with extract of gentian.

Rectal Injections of Sodium Cacodylate are employed by J. Renant in two strengths, the *weaker* containing 25 Gm. of the salt, the *stronger* 40 Gm. in 200 Cc. of water; and of these 5 Cc. are administered per rectum twice a day under certain limitations.

Hypodermic Injection of Sodium Cacodylate, as proposed by A. Gautier, is prepared by Danlos by the following formula: Morphine hydrochlor., 0.0025; cocaine hydrochlor., 0.010; sodium chloride, 0.020; sodium cacodylate 5.0; phenol solution (5 per cent.) 2 drops; distilled water, enough to make 100 Cc. Hypodermatically the maximum of 10 centigrammes in 24 hours should not be exceeded.—Pharm. Journ., Sept. 9, 1899, 252; from Bull. gén. de Therap., *128*, 220.

Wood Tar Creosote—Composition and Official Requirements.—Lyman F. Kebler briefly enumerates the phenols which, in accordance with the most recent researches, may be looked for in wood tar creosote. The belief has hitherto been entertained that creosote consists for the greater part of two phenols, guaiacol and creosol, the one or the other predominating, and that guaiacol to the extent of sixty or more per cent. could easily be obtained by fractionating a good quality of creosote. Whatever may have been the condition of creosote in the past, in the author's experience it is difficult to purchase creosote containing 20 per cent., and an article containing 60 per cent. of guaiacol is a curiosity. Indeed, it seems likely that the high percentages reported by some workers are due to faulty methods of analysis. In fractionating genuine beechwood creosote, A. Béhal and E. Choay (see Proceedings, 1894, 1215) obtained 39 per cent. monophenols, 26.48 per cent. guaiacol and 32.14 per cent. creosol and homologues with 2.38 per cent. loss. These results would indicate that a specimen of creosote containing 25 per cent. of guaiacol is a

fairly good one, and other recent analyses contribute towards this view. *Oakwood* and *beechwood creosote*, which are qualitatively alike, contain about the same amount of creosol and homologues, but oakwood creosote contains more of the monophenols and correspondingly less guaiacol. *Pinewood creosote*, distilling between 200° and 220° C., has been shown to contain 40 per cent. of monophenols, 20.3 per cent. of guaiacol and 37.5 per cent. of creosol and its homologues. Mr. Kebler has subjected six samples of wood-tar creosote, obtained directly, as far as could be ascertained, from as many manufacturers, to fractination and the tests of the U. S. P., his results being given in several tables.

Guaiacol Determinations were made in four samples, two of them being entirely free from it, while the others yielded respectively 8 and 16 per cent. They contained, however, considerable quantities of creosol and homologues as evidenced by the percentage of the crystalline potassium guaiacol and creosol compound (60, 48, 60 and 106 per cent.) obtained by the process of estimation employed, which was as follows: Mix 5 Cc. of creosote with 50 Cc. of a 20 per cent. of absolute alcoholic solution of potassium hydrate; in from 10 to 30 minutes a crystalline mass will result, due to the combination of guaiacol and creosol with the potassium. Press crystalline mass between filter paper until dry, place into a test tube, add 5 Cc. of 10 per cent. sulphuric acid, heat the mixture a moment and the guaiacol and creosol will rise to the surface. Dilute sufficiently with water so that the oily portion will sink to the bottom, decant the aqueous portion and add 4 Cc. of concentrated ammonia water. A hard crystalline compound is immediately formed with the guaiacol, and after some time a semi-crystalline mass results with the creosol. On treating this crystalline mixture with benzin, all but the guaiacol-ammonium compound is dissolved, which may be separated by filtration and washing. The guaiacol is then separated from the solid residue by treatment with 10 per cent. sulphuric acid, extraction with benzin, and evaporation in a tared vessel. In the author's experience the pharmacopœial requirements for creosote should be based on the following points: Physical appearance, solubility, specific gravity not below 1.080 at 15° C., boiling point between 200° and 220 C., reaction with a 20 per cent. absolute alcoholic solution of potassium hydrate, and a test for neutral oils—the latter, however, being indicated by the boiling point.—Amer. Journ. Pharm,, Sept. 1899, 409–413.

Creosote.—Inefficiency of the Collodion Test for the presence of carbolic acid. See *Collodion*, under "Pharmacy."

Carbolic Acid—Proposed Admixture with Grain Alcohol for Household Purposes.—S. W. Williams, in view of the frequent statements recently made that grain alcohol is an effective antidote for carbolic acid, and that this poison may be taken with impunity if immediately followed with alcohol, suggests that a mixture or combination of phenol and grain alco-

hol would be a comparatively safe and effective household preparation The claim of the comparative innocuousness of carbolic acid under the conditions named is apparently well founded, and if practical experiments are in the affirmative, it remains only to make the idea commercially practicable.—Drugg. Circ., March, 1900, 46.

Phenyl Benzoate — Preparation from the Acetate. — According to F. Bodroux phenyl acetate may be converted, almost quantitatively, into benzoate, at the ordinary temperature, by the action of benzoyl chloride and zinc dust. The phenyl acetate and benzoyl chloride (in molecular proportions ? Rep.) are introduced into a capacious flask, and a small quantity of zinc dust added. The mixture gradually develops heat, and in a few minutes violent reaction takes place, with the abundant evolution of hydrochloric acid. When reaction ceases, the product solidifies in a few hours into a crystalline mass of impure phenyl benzoate. This solidification may be hastened by agitating with dilute solution of potash. On recrystallization from dilute alcohol, phenyl benzoate separates out in large prismatic crystals, melting at 69° C.

The same reaction may be obtained with the acetic ester of thymol and of paracresol, but beta-naphthol acetate does not undergo the same conversion.—Pharm. Journ., March 3, 1900, 225 ; from Bull. Soc. Chim., *23*, 54.

Chlorobromophenes—A Series of New Compounds.—V. Thomas describes some new compounds which he has obtained in a fairly pure state, and also describes the general method of the preparation of the chlorobromides $C_6H_{(5-n)}Br_nCl_n$. The method consists of heating together in a flask with a reflux condenser phenyl bromide and ferric chloride. The proportions to be used are very variable. The reactions begin at a low temperature (about 40° C.) and proceed slowly. By increasing the temperature hydrochloric acid is given off in abundance, and if raised to the sublimation point of ferric chloride, the fumes are immediately reduced and ferrous chloride formed. At a high temperature, the derivatives rich in chlorine have a great tendency to form, for it is a general fact in the whole series that the more a compound is chlorized the more difficult the final chlorination becomes, and thus requires more heat.—Chem. News, Aug. 4, 1899, 59 ; from Bull. Soc. Chim. (3), *21*, No. 5.

Egols— A New Class of Phenolic Antiseptics.—E. Gautrelet states that when parasulphonic derivatives of phenols are nitrated, the ortho-nitro-parasulphonic acids obtained readily combine with an atom of mercury for each two atoms of the phenol present. In this way he has obtained ortho-nitro-phenol, cresol, and thymol parasulphonates of mercury and of potassium, to which he has given the generic name "egol," the phenolic constituent being denoted as a prefix, thus :

Phenegol, Cresegol, Thymegol, etc.—These bodies are very stable, occurring in reddish-brown powders. They crystallize with difficulty in rhom-

bohedra from dilute alcoholic solution, are readily soluble in water, and insoluble in strong alcohol. Their aqueous solutions are odorless and tasteless, neither caustic nor irritant, do not coagulate albumin, are not decomposed by organic matter, but precipitate toxins. They are non-toxic in doses of 2 Gm. per kilo of body-weight when injected hypodermically, but they act as emetics when taken in the stomach. They are powerful bactericides, arresting all development of bacterial culture when present in proportion of 4 : 1000, and prevent the development of germs when added to sterilized media.—Pharm. Journ., Sept. 9, 1899, 235; from Compt. rend., *129*, 115.

Creolin—High Specific Gravity of Commercial "Bulk" Lots.—Creolin, which first appeared on the market under the specific brand of "Creolin-Pearson," has been examined in samples from bulk lots by Charles H. La Wall and Robert C. Pursel, and found to vary greatly in specific gravity from the original product, which is 1.0422. In twenty-one samples the specific gravity varied from 1.0623 to 1.0780, the average being 1.0711.—Amer. Journ. Pharm., Aug., 1899, 393: Proc. Penna. Pharm. Assoc., 1899, 154.

Thymol Carbonate—A Substitute for Thymol for Internal Use.—By passing phosgene gas, $COCl_2$, through a 10 per cent. solution containing a calculated quantity of thymol, thymol carbonate separates according to J. E. Pool, in the form of an almost tasteless, pale yellow, syrupy liquid, which is insoluble in water, soluble in alcohol, and decomposed by alcoholic sodium hydrate into thymol sodium and sodium carbonate. Undergoing decomposition only when it reaches the intestines, thymol carbonate does not give the usual unpleasant symptoms of thymol, for which it is recommended as a substitute.—Pharm. Centralh., *40*, 403.

Glycerin—Satisfactory Commercial Conditions.—Prof. Chas. Caspari, Jr., has made a series of examinations and experiments in order to determine the question whether glycerin made from soap-lye is inferior to that produced by candle manufacturers. He gives details of the experiments made and communicates the results obtained with different samples of glycerin representing both kinds in the form of a table. The conclusion reached is that good glycerin conforming to the Pharmacopœial requirements can be obtained without difficulty, and that the source of glycerin, whether soap-lye or candle manufacturer's residue, plays no part in the quality of the article offered for use in pharmacy.—Proc. Maryland Pharm. Assoc., 1899, 86–93.

Glycerin—Examination of Commercial Samples.—E. H. Gane observes that while most of the glycerin of the market is fully up to the U. S. P. requirements, occasionally a sample is met with which contains foreign substances. One sample in particular gave a somewhat heavy precipitate with copper, showing traces of saccharine matter. This was not present in sufficient quantity to be designated an adulteration, and was possibly formed by the use of too high a temperature in rectifying the glycerin.

All samples were examined for traces of arsenic by Gutzeit's test, iodine being employed to remove sulphur compounds, but no sample gave any indication of the presence of arsenic. One sample gave a heavy precipitate with silver nitrate, showing nearly 1 per cent. of sodium chloride. So large an amount is very unusual and pointed to accidental contamination. —Amer. Drugg., Jan. 10, 1800, 4.

Glycerin—Properties.—In the course of experiments concerning the quantitative determination of glycerin, Heinr. Struve has determined that the purest glycerin obtainable contains from 6.02 to 8 0 per cent. of water, and that this content cannot be completely removed by drying it under the receiver of the air-pump, 1.52 per cent. being retained by the glycerin. On distilling glycerin with water, small quantities of glycerin are carried over with the water vapor.—Apoth. Ztg., April 28, 1900, 286 ; from Ztschr. Anal. Chem., 1900, 95.

Glycerophosphoric Acid—Conditions of Formation.—H. Imber and G. Belugon say that the speed and limit of etherification of phosphoric acid by glycerin depend not only on the state of hydration of the acid and the temperature, but also on the time. Thus at 15° C. it reached its maximum (23.48 per cent.) in 2 hours, and was then constantly diminished up to 96 hours. The conditions at 50° C. were much the same ; but at 105°C. the quantity was increased up to 45 hours, when it reached 43.12 per cent., while at 75 hours it had again fallen to 42.87 per cent.—Chem. News, March 30, 1900, 155 : from Journ. de Pharm. (6) x., No. 12.

Glycerophosphates of the Alkaline Earths—Solubility in Water at Different Temperatures. — According to Pelouze, the alkaline-earthy glycerophosphates are less soluble in hot than cold. J. Cavalier and M. Ponget have determined the solubility of calcium glycerophosphate in water at different temperatures, and found the solution saturated at the different temperatures to contain the percentage of anhydrous salt indicated in the following : At 16°, 7.9 per cent. ; at 36°, 4.4 per cent. ; at 71°, 2.3 per cent. ; at 77°, 1.3 per cent, ; at 86°, 1.25 per cent. ; and at 100°, 1.15 per cent. Consequently, a cold saturated solution of calcium glycerophosphate deposits the greater part of its salt on boiling. Barium glycerophosphate behaves somewhat differently ; its solutions are more easily decomposed by heat, but the deposition by heat is less abundant. The authors also find that glycerophosphoric acid when heated with water at 88°C., possesses less stability than the corresponding ethyl compound, but about the same as methylic and ethylic esters.—Chem. News, Nov. 3, 1899 ; 219, from Bull. Soc. Chim. (3) *21*, No. 8.

The foregoing observations find further confirmation in a paper by P. Carles on

Glycerophosphate of Lime.—Mr. Carles observes that it is generally admitted that, of the glycerophosphates, that of lime is the one to be preferred. This, however, is not very soluble, its co-efficient of solubility

being from 3.3 to 6 per cent., according to different authors. The author has endeavored to account for this rather wide variation. He found that the maximum of solubility of the crystallized neutral glycerophosphate of lime was reached at 28° C. : if the temperature be increased above this point, the solubility rapidly decreases, and it becomes almost insoluble again. He confirms the results of other writers, that the addition of a little acid greatly increases the solubility of the salt, but he does not recommend the use of citric acid, as an insoluble citrate of lime is gradually formed ; oxalic acid gives much better results. One hundred Gm. of the neutral powdered glycerosulphate should be added to 800 Gm. of warm water ; 30 Gm. of oxalic acid is then dissolved in 100 Gm. of boiling distilled water. These two solutions must be thoroughly mixed and filtered ; the precipitate is washed until the filtrate is one liter in volume. The solution is perfectly clear and contains no trace of oxalic acid, and is also very stable, even after prolonged heating on a water-bath.—Chem. News, Nov. 10, 1899, 231 ; from Bull. Soc. de Pharm. de Bordeaux, July, 1899.

Glycerophosphates—Commercial Quality.—J. H. Hoseason has examined a number of samples of glycerophosphates collected during the past few years, with results shown in the appended table. Samples of the potassium and sodium salts by different makers had varying physical characters, some being in the form of a thick syrup, others existing as a stiff paste, manufacturers evidently working to a percentage of phosphoric acid. A possible explanation of this is the fact that glycerin and phosphoric acid may combine in various ratios, giving rise to different glycerophosphoric acids. A great improvement has been effected recently in the manufacture of these salts, the charring usually occurring during the combination of glycerin and phosphoric acid being avoided to a great extent, so that the salts are less highly charged with coloring matter than formerly.

No.	Salt Examined.	Percentage of Pure Salt.	Remarks.
		p. c.	
1	Sodium glycerophos. 75 paste	74.8	Color, pale straw.
2	Sodium glycerophos. 75 liquid	72.2	Color, dark brown.
3	Sodium glycerophos. 75 paste	75.5	Color, dark brown.
4	Sodium glycerophos. 75 liquid	48.9	Color, dark brown.
5	Potassium glycerophos. 75 thick liquid	74.9	Color, pale straw.
6	Potassium glycerophos. 50 liquid	52.3	Color, dark, contains. 4 per cent. K_2HPO_4.
7	Calcium glycerophos. white powder	99.2	H_2O 8.2 per cent.
8	Calcium glycerophos. white powder	98.1	H_2O 9.34 per cent.
9	Calcium glycerophos. yellowish powder	97.8	H_2O 9.72 per cent.
10	Iron glycerophos. scales	92.6	79.8 per cent. Fe (ous).
11	Iron glycerophos. yellow powder	91.4	50.2 per cent. Fe (ous).
12	Quinine glycerophos. grey crys. mas	93.3	Excessive moisture.
13	Quinine glycerophos. grey crys. mas	92.6	Excessive moisture.

The percentages of pure salt were calculated from the H_3PO_4 content, except in the case of the quinine salts, which were calculated from the amount of alkaloid found.—Pharm. Jour., April 21, 1900, 419.

FIXED OILS.

Acroleïn—Preparation.—For the preparation of acroleïn in quantities the customary method—hydrolyzation of glycerin with potassium bisulphate—is, according to A. Wohl and L. Neuberg, not suited owing to the difficulties of purification and loss by decomposition of the organic material. They therefore propose the following method, which is free from these objections: An intimate mixture of 40 Gm. glycerin and 15.2 Gm. powdered anhydrous boric acid is rapidly distilled in a methyl retort. A brown-yellow oil is then obtained, along with some water, from which, by repeated distillation and final drying over calcium chloride about 12.5 Gm. of faintly yellow, but otherwise pure acroleïn is obtained. If crystallized boric acid is used, the proportions are glycerin 50 and boric acid 33 parts; the yield of acroleïn is in the same relative proportions as by the preceding method, but the distilling method must be conducted at a much higher temperature, owing to the difficulty to decompose the intermediary boroglycerin compound formed.—Pharm. Centralh., July 13, 1899, 431.

Mercury Stearate and Palmitate—A Substitute for the Oleate, Mercury Oleate Being a Rather Unstable Preparation.—F. A. Sieker has for some years prepared with satisfaction the stable compound of stearic and palmitic acids, resulting when 568 parts of stearic acid, U. S. P., 1890 (which is a mixture of stearic and palmitic acids), is fused in a porcelain dish over a gas flame and 215 parts of yellow mercuric oxide are gradually added. Just sufficient heat is applied to keep the mixture fused until the mercuric oxide is dissolved. After cooling, the resulting white or almost white mass may be reduced to a coarse powder. It contains about 26.1 per cent. of mercury, equivalent to 28.19 of mercuric oxide, is permanent, and may be heated to fusion over a gas flame without decomposition. By the addition of liquid fats it is readily converted to an ointment. A good formula for a 10 per cent. (mercuric oxide) ointment is obtained, for instance, by heating 10 parts of this stearate and palmitate and 10 parts of liquid petrolatum to fusion and then incorporating 8 parts of liquefied anhydrous lanolin, stirring the mixture until cool. Prepared in this way, an ointment has been kept by the author for a year without showing the slightest trace of decomposition. — Pharm. Review, Sept., 1899, 396–397.

Almond Oil — Detection and Distinction of Apricot and Peach-kernel Oils.—John C. Umney and Ralph S. Swinton state that the second grade almond oil sold under the name of "Oleum Amygdalæ Persic.," or "oleum amygdalæ exot.," is derived, according to their relative market value, from either apricot or peach kernels, and that owing to the former being at the present time the cheaper, the oil met with in commerce under the names

mentioned is almost without exception that of apricot kernel. The B. P., 1898, assumes the absence of peach kernel and other fixed oil by the following test, which is practically the same as given in the U. S. P.: "If two cubic centimeters of the oil be well shaken with one cubic centimeter of fuming nitric acid, and one cubic centimeter of water, a whitish, not brownish-red, mixture should be formed, which, after standing for six hours at about 50° F (10° C.), should separate into a solid white mass and a nearly colorless liquid." The authors have applied this test to the pure oils obtained by them from apricot and peach kernels by extraction with ether. They are practically indistinguishable in specific gravity, and there is no apparent difference in the point at which they become viscid on cooling, but under the official nitric acid test they exhibit a marked difference. In the case of *peach kernel oil* the color produced is almost white, with the slightest trace of darkening, but no brown color, and on standing as required, a very pale yellow mass and nearly colorless liquid are produced. The *apricot kernel oil*, however, darkens considerably, and separates into a brownish, solid mass, in almost the same time, and a yellowish-brown liquid. The application of the test to *oil pressed from almonds* only shows the very palest yellow coloration and separation of the solid mass practically indistinguishable from that afforded by the oil of peach kernels.—From. Brit. Pharm. Conf., 1899, 444–446.

Oleum Theobroma—Adulterants and Constants.—A. Ruffin states that the solid fats, obtained by subjecting coca-nut oil to hydraulic pressure, are the chief adulterants of cacao butter, but other animal and vegetable fats are used for the purpose. So that to obtain a definite opinion as to the purity of a specimen the following determinations are requisite: Specific gravity, refraction index, saponification number, iodine number, melting point, soluble fatty acid number. Cacao butter has, according to the author, the following constants: Sp. gr., 0.920, refraction index, 34; saponification number, 179-180; iodine number, 48; melting point, 50° C.; titre of fatty acids, 23°. The addition of vegetable fats will increase the density, and the iodine number, while the other constants will be lowered. Animal fats, on the other hand, raise the melting point and the fatty acid figure, while the refraction index is lowered. Coco-nut fat, however, considerably increases the saponification number and the refraction index, while the other constants are lowered. On etherification of the fatty acids obtained in the presence of alcohol and of sulphuric acid, the characteristic odor of coccinic ether will confirm the presence of coco-nut fat.—Pharm. Journ., No. 11, 1899, 445; from Annales de Chim. Analyt., 4, 344.

Cacao Butter—Constants that are Sufficient to Establish Absence of Foreign Vegetable Oils and Fats.—In the course of the examination of a number of cacao butters, Dr. J. Lewkowitsch made some observations which are at variance with published and accepted statements, the results obtained being given in the tables. The constants given in the first table

were considered sufficient in number to establish with satisfactory accuracy whether adulteration with foreign vegetable oils and fats had been practiced. The numbers agree with the constants hitherto accepted, with the exception of the Reichert-Meissl value—the constant for volatile fatty acids—Allen having given the Reichert value of cacao butter as 1.6, which is equal to Reichert-Meissl value of about 3.62. It will be seen from the numbers obtained from a few genuine samples in the table that Allen's number must be abandoned, cacao butter not differing in its content of volatile fatty acids from the majority of vegetable and animal glycerides. The detection of considerable quantities of cocoanut and palm-nut oils in adulterated cacao butters is therefore easy, and mixtures of genuine cacao butters and cacao butter substitutes in about equal quantities, which would have passed as pure if judged by the Reichert-Meissl value alone, can be easily identified by the combined determination of the saponification, Reichert-Meissl, and iodine values. From the numbers given under the heading "constants," it follows that vegetable oils and fats, such as almond oil, olive oil, hazel-nut oil, sesame oil, cocoanut oil and palm-nut oil must be absent; further, that beeswax and paraffin wax could not be present, and, as is shown by the melting point of the fat and the solidifying point of the fatty acids, that considerable quantities of tallow could not have been admixed with the butters. The numbers given under the headings "acid value," although not negligible in the present case, are not excessive, as comparison with others shows.

No.	Constants.					Variables.
	Melting Point.	Solidifying Point of Fatty Acids. (Titer Test).	Saponification Value.	Reichert-Meissl Value.	Iodine Value.	Acid Value.
	C.	C.				
1. Samples submitted for examination	26.6–28	47.2–49.2	191.8–194.5	0.38–0.94	34.27–36.99	1.82–4.49
2. Cacao butter prepared in the laboratory from nibs	28.4	.....	192.9	0.50	35.65	1.95
3. Genuine cacao butter kept ten years in a sealed bottle	27.0	48.0–48.27	192.0	0.20	36.92	4.60
4. Genuine English cacao butter, fresh	28.33	48.55–49.1	193.5	0.38	35.37	1.65
5. Genuine English cacao butter, another make, fresh	28	48.85–49.2	193.1	0.33	34.86	1.39
6. Genuine Dutch cacao butter, fresh	27.2–33	....	192.8	0.83	34.55	1.1

While these experiments have demonstrated the absence of foreign vegetable oils and fats, and also more than ten per cent. of tallow in the samples submitted for examination, the absolute absence of the latter can only be demonstrated by the aid of a microscopic examination of the repeatedly crystallized unsaponifiable portions of the fat, by means of which it becomes possible finally to recognize the presence of cholestrol, derived from tallow, in admixture with the phytesterol common to all vegetable fats. Another point upon which the author's experiments throw some light is that of the

Rancidity of Cacao Butter, the possibility of which is disputed in a number of text-books, though such are usually antiquated. Increase in acidity gives no criterion of rancidity, since by age the acid value may rise, and the sample yet not show any rancidity. Indeed, in the second table, here following, it is shown that the acid value may even decrease. Recently several chemists have proposed the detection of rancidity by the presence of aldehydes, and these have been determined in the present experiments, but the author refrains from drawing any conclusions until further experiments have been made in this direction. For the present, he prefers to rely on the so-called organoleptic tests, viz., taste and smell, if the question has to be answered whether a fat is rancid or not. In order to prove by experiment that cacao butter will go rancid like any other fat, the author exposed one of the samples submitted to him, and which was still "sweet," and the other genuine samples to the action of sunshine, air and moisture, during the period indicated in the table, and found that they one and all became white and decidedly rancid, having acquired a nauseous taste and the repulsive odor of rancid fat. In the following table the numbers of the sample refer to the same samples in the first table, No. 2 being omitted:

Specimen.	Not Rancid.				Rancid.				
					After 3–4 days exposure.	After lapse of a fortnight again exposed 3–4 days.			
No.	Acid Value.	Saponification Value.	Reichert-Meissl Value.	Acetyl Value.	Acid Value.	Acid Value.	Saponification Value.	Reichert-Meissl Value.	Acetyl Value.
1	1.83	192.6	0.72	2.86* / 2.71	—	1.85	193.1	0.44	5.0 / 4.8
3	4.60	192.0	0.20	—	5.74	6.36	194.4	0.55	10.0 / 10.0
4	1.65	193.5	0.38	—	1.40	1.70	193.4	0.55	—
5	1.39	193.1	0.33	—	0.91	—	—	—	4.4 / 4.9
6	1.1	192.8	0.83	—	1.06	1.69	193.0	0.44	5.7 / 5.9

* The acetyl value is given in the upper figure as obtained by the distillation method, in the lower by the filtration method.

—Pharm. Era, Aug. 3, 1899, 167, 168; from Jour. Soc. Chem. Indust.

Hazel-nut Oil—Characters and Composition.—Jos. Hanna has investigated the characters and composition of hazel-nut oil, which he had extracted from the nuts by means of ether. It had the sp. gr., 0.9169, and is composed of oleic acid, 85 per cent.; palmitic and stearic acid, 10 per cent., and 0.50 per cent. of phytosterin, and exhibited the following constants: saponification number, 193.70; iodine number, 90.20; Hehner's number, 95.60; Reichert-Meissl number, 0.99, acetyl number, 3.2; percentage of glycerin, 10.41 per cent. The insoluble fatty acids gave a saponification number of 200.6; iodine number, 91.30; Maumene's number,

36.2; average molecular weight, 282.—Apoth. Ztg., Nov.15, 1899, 687; from Ztsch. f. Unters. d. Nahr. u. Genussm., 1899, 617.

Peanut Oil—Advantages over Other Oils for Pharmaceutical Purposes.—After reviewing at length the history of peanut oil, its characters aud constants, etc., J. W. Thomas expresses the opinion that it is an especially useful oil for preparing the liniments of the Pharmacopœia. In making ammonia and lime liniments the saponification is perfect and the product smooth and bland, and is thoroughly absorbed, leaving no gummy feeling on the part applied. In camphor liniment, so largely used, it makes a beautiful liniment, the camphor being more readily soluble in it than in cottonseed or olive oils. If used for preparing chloroform liniment, alcohol, which the author regards as objectionable, is done away with, the liniment produced holding the official quantity of chloroform in suspension, or rather solution, until its efficacy can be established. In its medicinal application its value cannot be over-estimated, combining, as it does, properties that cottonseed oil does not, and aperient properties that overcome the acridity of castor and olive oils.—Drugg. Circ, July, 1899, 152.

Quince Seed Oil—Yield and Characters.—According to H. Thoms, the oil from quince seed, which is present to the amount of about 15 per cent., is yellow, has an almond flavor and the sp. gr. 0.922. It gave the following constants: Acid number, 31.7; Koettstorfer number, 181.75; iodine absorption (Hübl) number, 113; Reichert-Meissl number, 0.508: Hehner number, 95.2. It contains at least two saturated acids, one of which is identical with myristic acid.—Pharm. Journ., Oct. 21, 1899, 377; from Archiv., *237*, 358.

Lard, Tallow and Mutton Suet—Inquiry into the Causes of Change.—The presence of 28 per cent. of free fatty acids in imported beef tallow and the claim that under the influence of the heat of the tropics during transportation as much as 40 per cent. of free fatty acids may be produced in the rendered tallow, has induced Eugene Dieterich to undertake an extensive series of experiments in order to determine the conditions under which these changes occur. He finds, in the first place, that the splitting off of the large percentages of fatty acids never occurs in fat that has been rendered from fresh material, but results in fat rendered after decomposition has set in in the crude material. Furthermore, the usual assumption that the decomposition of crude animal fats is due to the presence of a special ferment, and that the greater stability of rendered fats is due to the destruction of the ferment by the heat employed in rendering, is also not in accord with the results obtained by the author's experiments. He finds that if the crude material is placed in layers, the one upon the other, while still warm from the animal heat, considerable heat is developed, the material assumes a greenish color and becomes putrid in the course of a few hours. If, however, the crude fat is allowed to cool before heaping it in layers, this change does not occur. The author's experiments prove that

the changes observed in the crude material are due to the elevated temperature (30°–35° C.) in presence of air and water, and that the latter particularly exerts a material influence in promoting decomposition. In the case of hog-products the splitting off of free acids is greater in the bacon than in the leaf fat, and the smoked bacon is more sensitive to the influence of elevated temperatures than the salted bacon, this being probably due to the changes which have already taken place in the bacon during the process of smoking. Mutton suet is less susceptible to external influences than beef tallow. In all samples obtained under the varying conditions of the experiments the usual constants—acid, iodine and refractometer numbers, melting and congealing points, spec. grav., etc.—were determined, but the author finds that the acid number is the only constant from which important conclusions can be drawn.—Apoth. Ztg., Dec. 6, 1899, 734–735.

Butter—Variation in Composition.—Experiments made by J. J. C. van Rijn make it evident that the composition of butter is liable to much greater variation than is generally supposed. The author examined butter which was churned during the months of September to December, inclusive, at 24 places in various parts of Holland and in the presence of specially appointed officials, one-half of the 700 samples being churned from the cream separated from the mixed milk of 500 to 1000 cows. He found the Reichert-Meissl number to fluctuate between 17 and 32: the numbers 20–21–22 were frequently obtained, but fluctuations between 23 and 26 were most numerous (about one-half). The reduction of free fatty acid is doubtless in proportion to the advance of the period of lactation, while a rapid and notable increase in fatty acids was observed when the cattle were removed from the pasture to the stable.—Chem. Ztg., 1899, 453.

Cetyl Alcohol—Dermatological Use.—F. Grimm states that cetyl alcohol (also called "æthal"), which combined with palmitic acid constitutes the well known spermaceti, has been employed with advantage for various dermatological purposes. It is odorless, tasteless, soluble in water, melts at 49.5 C., and is readily reduced to a soft powder, which is unctuous to the touch, and particularly suited for the treatment of rough and chapped cuticular surfaces. Grimm recommends it for such purposes in admixture with an equal weight of boric acid or five times its weight of talc. It is stated that the substance introduced under the name of "Borsyl" contains cetyl alcohol, while the "fat powder" of Leichner is said to contain the spermaceti itself, a substance which may possibly answer the purposes for which cetyl alcohol is recommended quite as well.—Pharm. Centralh., Aug. 10, 1899, 488.

CARBOHYDRATES.

Cellulose—Question of its Presence in Ossa Sepiæ.—The opinion expressed by Ambroun that cellulose is a constituent of ossa sepiæ, which

has since been contested by Krawkow and Lauder, has led F. N. Schulz to make a comprehensive investigation of the subject. This leads him to the conclusion that cuttle-fish bone contains no cellulose, but does contain, besides chitin, large quantities of albumin, which, being soluble in Schweizer's reagent, is, like cellulose, precipitated on neutralization with hydrochloric acid in the form of a copper compound. When this compound is decomposed with hydrochloric acid in excess, a portion of the albumin remains undissolved, and may thus have been mistaken for cellulose.—Apoth. Ztg., March 3, 1900, 149; from Ztschr. Physiol. Chem., 1900, 1241.

Cellulose—New Industrial Products.—Dr. C. O. Weber calls attention to a new product of cellulose, produced during the last three or four years, which constitutes the point of departure of a whole series of homologous bodies, some of which are certainly destined to play an important part from the industrial point of view. This is

Cellulose Tetracetate, $C_6H_6O_5(C_2H_3O_2)_4$, produced by a method discovered by Cross and Bevan, depending on the inter-action of acetyl-chloride, magnesium acetate and cellulose; the manufacture of this cellulose derivative being already carried out on a large scale, as also that of its homologue.

Cellulose Tetrabutyrate.—These ethers, unlike the only ether heretofore known, nitrocellulose, are not explosive, and not even inflammable, burning only imperfectly. In their solubilities, however, they behave in the same manner as the nitro-derivatives, in so far that all their solutions are of a colloidal nature; but they differ from these with regard to the extent of their solubility. The acetate is completely insoluble in methyl and ethyl alcohols, ethyl and amyl acetate, acetone, and in ether, but is soluble in ethyl benzoate, chloroform, epichlorhydrine, acetic anhydride, glacial acetic acid, and in nitrobenzene. The solution of the acetate in the latter becomes on cooling a solid but completely transparent jelly. Furthermore, the acetate resists the action of reagents in a remarkable manner. With the exception of nitric acid, the dilute acids do not attack it at all, and the same is the case with alkaline lyes even at high temperatures. It is very durable, and does not begin to soften below 150° C., this change not being accompanied by destruction of the material. The films obtained by evaporating its solutions are very transparent. Those from solutions of the butyrate resemble these, but are more flexible and softer. — Chem. News, Nov. 24, 1899, 248.

Chemically Modified Cellulose—Industrial Products—In connection with the foregoing, a review of the different products of chemically modified cellulose that have found industrial application, by S. Ferncezl, is interesting. The author observes that as far back as the seventeenth century objects have been made of mixtures of paper pulp with gypsum, resin, or

similar substances, but in these the vegetable cell, though destroyed, retained its original physiological properties. In the more modern industrial products, in which the raw material is treated with chemical reagents, the vegetable cell is more or less completely destroyed, the result being an amorphous mass suitable for further treatment. These are here enumerated briefly, as follows:

Parchment Paper, obtained by subjecting unsized paper to the action of sulphuric acid at 30° B. under certain provisions. During the last thirty years the quality of this product has been highly improved, though different grades and qualities are still prepared, according to the intended use. The older kinds, when submitted to mastication, give a fibrous mass with short fibres, while "true parchment paper" gives a more or less hard mass, in which the presence of fibres cannot be detected. The former kind, being about one-half the price, is used for packing perishable articles, such as food stuffs. When sulphitic (parchmentized) cellulose, obtained by direct action upon cellulose pulp, is triturated to an extreme, so as to completely destroy the textile fibres, and this uniform amorphous pulp is allowed to evaporate spontaneously, blocks of amorphous cellulose are obtained. This has been named

Cellulith, which, after treatment with a jet of steam or by boiling to remove entangled air, is used for a variety of purposes. After the addition of coloring matters, if desirable, it may be worked up like horn, ebonite and similar substances, being particularly suitable for valves on account of its resistance to the action of alcohol, petroleum, fats and oils. It is fairly elastic. But sulphuric acid is not the only agent capable of transforming cellulose into an amorphous mass. Zinc chloride and ammoniated cupric oxide act in the same manner, producing a

Vulcanized Fibre, which, as prepared with zinc chloride, has found a variety of applications. The treatment with chloride of zinc is very difficult and complicated, especially if it is desired to obtain the material in the form of card-board of considerable thickness—say 10 Mm. This unsized paper is dipped in a solution of zinc chloride of known strength and at a given temperature. After removing the excess of the reagent, the mass obtained is subjected to pressure until of the required thickness. It is washed and then exposed for some weeks to the action of the wind and rain; this being considered an important factor in the conversion of the cellulose into "hydrocellulose," and seems to be indispensable if great thickness is required, combined with sufficient hardness and durability. It is finally again washed. Commercially two kinds of "vulcanized fibre" are known, the flexible and the hard, which, according to the kind, are used in the manufacture of valves, tubes, etc., to replace india rubber, or into sheets, rods and the like—the hard kind being sawed, turned and polished readily.

Celluloid is too well known to require more than passing mention. Sheets of nitrocellulose are produced by a suitable method, and these, carefully washed and dried, are cut up, ground and intimately mixed with camphor. The plates thus prepared begin to soften at 80° C. and at 125° C. they become plastic and malleable, so that they may be given any desired form. Finally, by a process which is kept secret, a cellulose product called

Pegamoid was introduced by English manufacturers in the form of articles imitating leather. These articles are water-proof, and are given any desired color. All articles made of "pegamoid" have a smell of camphor, which points to the presence of "celluloid" as an ingredient. — Chem. News, Nov. 17, 1899, 238; from Ztschr. Angew. Chim., 1899.

Wood Pulp Sheets.—Use for making poultices, splints, ice caps, etc.; see *Cataplasmata* under "Pharmacy."

Pyroxylin—Precautions to Secure a Soluble Product.—E. Senft, among the many methods proposed for preparing collodion-cotton, selects that of the (German) Military-Pharmacopœia, 1891, for the purpose of exemplifying the precautions necessarily observed to produce a product permanently and uniformly soluble in a mixture of ether and alcohol. Into a mixture of 800 Gm. of crude nitric acid and 2000 Gm. of sulphuric acid 100 Gm. of purified cotton are submerged; the mixture is set aside for 24 hours at a temperature of 15 °to 20° C., is then transferred to a funnel, allowed to drain during 24 hours, washed with water until the acid is completely removed, expressed, and dried at a temperature of 25° C. Although this formula is clear and explicit, a number of precautions must be observed to secure a satisfactory product. The mixture of the acids should be effected under avoidance of heat, which is best accomplished by placing the vessel containing the sulphuric acid into cold water and adding the nitric acid slowly. The cotton having then been imbued in the acid mixture, the container is placed in a shady situation, where it is protected both from the light and heat of the sun, and where the temperature will not exceed 20 to 25° C. It is of importance also that the mixture be covered as soon as it is effected. Although in the opinion of Hager and others the prolonged immersion of the cotton in the acid mixture does not affect the solubility of the pyroxylin after it has been formed, the author is of the opinion that under such conditions, as also under the influence of the sun's rays, or of higher temperature than that given, sparingly soluble nitrocelluloses are formed. An exposure of 16 hours during summer is sufficient, while in winter this may be somewhat prolonged. Instead of washing the pyroxylin upon a funnel, it is to be transferred directly from the acid mixture to the water, and well washed—observing that it is necessary to loosen the fibres of pyroxylin which have unavoidably formed into little knots, so that all parts may be completely washed and deprived of acid. So prepared and dried it should dissolve readily and completely if,

as is directed for preparing collodion, 100 Gm. are first thoroughly imbued with 300 Gm. of alcohol, and then mixed with 2100 Gm. of purified ether and thorough shaking. If a somewhat larger proportion of alcohol is used an even handsomer preparation is obtainable.—Pharm. Post, Nov. 5, 1899, 607.

Gloss-Starch—Preparation.—According to a German patent gloss-starch is prepared as follows: 15 p. boric acid, 19 p. borax, 3 p. stearin, and 3 p. white wax are boiled with a calculated quantity of soda solution of 20° B., until a homogeneous mass is obtained. This is dried, powdered, and mixed with ten times the weight of the finest rice starch. — Apoth. Ztg., Nov. 1, 1899, 655.

Tragacanth Pentose Obtainable from Different Sorts.—Of the two pentoses hitherto obtained from natural products, arabinose was obtained some time ago from tragacanth by v. Sandersleben by hydrolysis with dilute sulphuric acid. Tollens and Widlove have now subjected different kinds of tragacanth to hydrolysis, and obtained from some sorts *arabinose* and from others *xylose*, the former from two samples of brown tragacanth, while xylose was obtained from three samples of white flake tragacanth. Besides these, the authors obtained a methyl-pentose, identical with the *fucose* obtainable from sea-tangle. — Apoth. Ztg., March 28, 1900, 299; from Berichte, 1900, *33*, 132.

Pectins—Chemistry.—Bourquelot, summarizing the results of his investigations on the pectins, states that all those examined by him are strongly dextrogyre; all yield arabinose when hydrolyzed with dilute sulphuric acid; and all are susceptible to the influence of a ferment,

Pectinase, which probably exists in the tissues of all plants, being derived for the purposes of the author's experiments from untorrified germinating barley. All pectins are coagulated by the ferment *pectase*, but after being treated with *pectinase* they no longer coagulate with pectase. Moreover, if pectinase be added to the coagulum already produced from pectin by pectase, liquefaction results.—Pharm. Journ., Aug. 5, 1899, 139; from Jour. Pharm. Chim. (3) *9*, 563.

Pectin—Preparation from Rose Fruits.—E. Bourquelot and H. Herissey have prepared pectin from the fruits of *Rosa canina* L., as follows: The pseudo-fruits, deprived of the carpels and hairs, are macerated during 24 hours with ten times their weight of chloroform water, expressed, the infusion filtered and precipitated with twice its volume of 80 per cent. alcohol containing 10 Cc. (pro liter? Rep.) of official hydrochloric acid. The precipitate is collected on a cloth, washed with cold alcohol, then twice with boiling 90 per cent. alcohol, finally with ether, and dried *in vacuo* over sulphuric acid. The crude pectin so obtained is purified by repeated solution in water and precipitation with 95 per cent. alcohol, and finally washed on the filter with alcohol and ether The product has a yellowish-brown

color and does not form an entirely clear solution with water. It is dextrorotatory, $[\alpha]_D = +165°$. Its solutions are coagulated by the action of pectase, like other pectin solutions, and also by lime water, baryta water, soda solution and hydrochloric acid. By the action of nitric acid it is converted into mucic acid, and reducing bodies are formed by the action of diastase. —Apoth. Ztg., March 14, 1900, 175; Jour. Pharm. Chim., 1899, x.

Pure Sugar—Supply Likely to Follow the Demand.—N. B. Schmidt observes that the market does not afford a sugar free from added coloring matter (blue) because there has been no demand. There are no difficulties in the way of making such a sugar, simply leaving out the coloring matter, and the cost would be no greater than now paid for the colored. Why not then create a demand for such an article as we feel we need? Let requests be made by druggists generally when buying sugar for such a product as described. Ask the jobber to communicate to the factory that such a demand has been made. If such course be generally followed the manufacturers will recognize the existence of a demand and will soon undertake to meet it.—Pharm. Era, March 8, 1900, 255.

Sugar—Change in the Method of "Blueing."—In connection with his paper on the influence of density on some official syrups (which see under "Pharmacy"), Prof. Scoville points out that the manner of giving sugar the appearance of whiteness by "blueing" has been changed by manufacturers. That ultramarine is now used for the purpose, does not to him appear probable. "The bodies most commonly employed for bluing at the present time," he writes, "are Prussian blue and dyes of the methylene blue class. These are not only cheaper, but are free from the property which ultramarine blue possesses of developing unpleasant odor in the presence of acids, due to the decomposition of the sulphides which it contains.—Drugg. Circ., Oct. 1899, 221.

Caramel—Distinct Commercial Sorts.—Schweitzer finds that there are two kinds of caramel in commerce. The one kind forms a dense brown precipitate on addition of acetic acid and lead acetate to its aqueous solution, while the solution of the other remains clear. The reaction in the first kind is due to the fact that it has been prepared by the aid of alkalies. He has obtained the coloring substance in a pure condition by caramelling cane sugar with 10 per cent. of soda, precipitating the aqueous solution of the caramel produced with lead acetate, and purifying the product by repeated solution in ammonia and precipitation with hydrochloric acid process. The author proposes the name

Alcaramel for the new substance, and assigns to it the empirical formula $C_{12}H_{11}O_4$. It reacts violently with oxidizing reagents, such as potassium permanganate and hydrochloric acid or fuming nitric acid, being converted into a brown coloring matter soluble in acids.—Pharm. Centralh., May 10, 1900, 284; from Chem. Ztg., 1900, Rep. 48.

Sodium Saccharate—A New Remedial Agent.—Schücking has employed sodium saccharate, $C_{12}H_{21}NaO_{11}$, a white powder, soluble in water and diluted alcohol, and decomposed by carbon dioxide into sugar and sodium carbonate, with advantage for transfusions. The best solutions for this purpose are composed of 0.08 per cent. sodium chloride, 0.033 per cent. sodium saccharate, and under circumstances, also 0.003—0.015 per cent. calcium monosaccharate.—Pharm. Centralh., March 22, 1900, 179.

Sugars—Improved Method of Titration with Fehling's Solution.—N. Schoorl claims that certain faults in the methods proposed by Lehmann in 1897, and afterwards by Riegler and Maquenne for the accurate and rapid estimation of sugars, which depend upon boiling of the sugar solution with Fehling's reagent in excess, and estimating this excess as CuI, are completely removed by the following volumetric course of analysis: Place 10 Cc. each of Fehling's copper solution and of Fehling's Rochelle Salt solution into a 200 Cc. Erlenmeyer flask, add the sugar to be determined —not exceeding 90 Mgm. of glucose or inverted saccharose, or 130 Mgm. of lactose—and then water to make a total of 50 Cc. of fluid. Heat this carefully on a wire netting over a flame, maintaining a boiling temperature for two minutes (in the case of lactose five minutes) and cool rapidly. Then add 10 Cc. of a 20 per cent. potassium iodide solution, followed by 10 Cc. of diluted sulphuric acid (containing 1.5 Cc. of concentrated acid). Reaction follows according to the equation: $CuSO_4 + 2HI = CuI + I + H_2SO_4$. Then at once titrate with $\frac{N}{10}$ sodium thiosulphate solution, until the fluid assumes a light brown color, carefully add, by drops and with continuous rotation, 5 Cc. of dilute starch solution (4 Gm. starch to 100 Cc. glycerin), and continue the titration until the color changes from light blue to cream yellow. The entire operation is finished in 10 to 15 minutes. The advantages of the method are: 1. An excess of sulphuric acid is avoided; 2. The cuprous oxide is not exposed long enough to change to cupric oxide; and 3. filtration is avoided. 1 Cc. of $\frac{N}{10}$ sodium thiosulphate solution corresponds to 4.5 Mgm. lactose, 3.2 Mgm. glucose, or 3.1 Mgm. saccharose. A table showing the values up to 27 Cc. of the thiosulphate solution is given by the author.—Apoth. Ztg., July 26, 1899, 442: from Nederl. Tijdschr. voor Phar. Chem. en Tox., July, 1899.

Reducing Sugars—Gravimetric Method of Estimation.—Dr. Ph. Chapelle recommends a new method for the gravimetric estimation of reducing sugar which is dependent on the action of the centrifugal machine, now coming into more common use in laboratories. It is driven by water pressure from the main, and makes about 3000 revolutions per minute. 100 Cc. of Fehling's Solution, containing 1 Gm. of cuprous oxide, is used, and 25 Cc. of this solution is mixed with the sugar solution, and the volume made up to 37.5 Cc. The tube is heated in a bath of a solution of chloride

of lime boiling at about 110° C. for six minutes in the case of glucose, and ten minutes for lactose. It is then put in the centrifugal machine. After two or three minutes, the precipitate adheres so strongly to the sides of the tube that the latter can be turned upside down and drained on linen. The deposit is taken up with boiling distilled water, and the tubes again submitted to centrifugal force, decanted, and dried at 150°–180°. The whole operation does not take more than twenty-five to thirty minutes.—Chem. News, Feb. 9, 1900, 71; from Journ. de Pharm. (6), x., No. 9.

Glucose—Gravimetric Estimation.—F. Fieyer has subjected Ambühl's simplified method for estimating sugar to critical examination and experiment, the method being based upon the direct weighing of the precipitated cuprous oxide after washing it with alcohol and ether, and drying at 100° C. The author finds that the method usually indicates a few $\frac{1}{10}$ milligm. more of sugar than is absolutely present, but that in the calculation for 1 liter of wine, as is customary, this error is insignificant, the difference showing only in the second decimal. The method is expeditious. It suffices to heat the washed Cu_2O for 10 to 15 minutes in the water-drying oven, if a current of dry air is passed by means of an aspirator, through the little tube containing the Cu_2O for a few moments before placing it into the oven.—Apoth. Ztg., July 19, 1899, 429; from Ztschr. landwirt. Versuchsw., 1899, *2*. 30.

Diabetic Glucose—Comparison of the Picric and Fehling Methods of Determination.—R. H. Parker observes that of the many available methods for the quantitative determination of diabetic glucose, the picric and Fehling tests offer most advantage to the busy pharmacist. The picric method is rapid, and with close attention to manipulative detail, constant results are easily obtained. The necessity, however, of removing creatinine and other "interfering substances," in order to deal with small percentages of sugar, involves too much time for clinical purposes. The Fehling method, when dealing with high percentages, is perfect; but if the sugar falls below 2 per cent., the cuprous oxide usually refuses to subside, so that rapid reading is impossible. To remedy this, it occurred to the author that this fault might be remedied by adding a known quantity of glucose to the specimen before determination, and this proved eminently satisfactory, an aqueous solution of commercial glucose of known strength being used for the purpose. Comparative experiments with the two methods, the results of which are given in tabulated statements, lead the author to the following conclusions: The production of opacity in Fehling's Solution by alkalized urine is characteristic of glucose, such opacity not being produced by "interfering substances." When the picric indication falls below 0.4 per cent., the actual amount of glucose present may be approximately ascertained by noting the point at which opacity, with Fehling's Solution appears, diluting until the Fehling remains unaltered

during ebullition, and becomes opaque about a minute later. Samples of urine giving the non-subsiding yellow cuprous oxide may be rapidly assayed with Fehling's Solution, if previously mixed with an equal volume of glucose solution of known strength (6 or 8 per cent). The author finds that diabetic sugar reacts even more sharply than commercial glucose, and has with advantage employed in place of the latter a diabetic urine of known and high sugar strength, and preserved with 1 per cent. of formalin.—Trans. Brit. Conf. 1899, 403–408.

Glucose—Impurities in Commercial Samples.—Constantine M. T. Klie examined two samples of commercial glucose, which is largely used for "improving" molasses. Both samples had an acid reaction, due to sulphuric acid, which in the one sample amounted to 0.2 per cent., in the other to 0.14 per cent. Both contained traces of calcium.—Proc. Missouri Pharm. Assoc., 1899, 51.

Mannose—Quantitative Determination.—According to E. Bourquelot and H. Hérissey, mannose may be determined quantitatively in the presence of other sugars by means of its crystalline compound with phenylhydrazine, which crystallizes readily and completely from solutions at a low temperature (10° C.). The reagent consists of phenylhydrazine, 2.4 Cc.; glacial acetic acid, 2.4 Cc.; distilled water to produce 12 Cc. The mixture is allowed to stand from 8 to 12 hours at 10° C., the crystalline mass drained in the filter-pump, washed successively with iced water, alcohol and ether, dried at first *in vacuo* over sulphuric acid, then at 100° C.. and weighed. With solutions containing less than 3 per cent. of mannose a correction of (? Rep.) 0.04 Gm. for every 100 Cc. of solution should be made. In this way quantitative estimations of mannose can be made in presence of galactose, arabinose, maltose, and dextrin.—Pharm. Jour., Sept. 16, 1899, 275; from Compt. rend., *129*, 336.

Mannogalactane—Presence in Lucerne and Fenugreek Seeds.—According to recent investigations of Bourquelot and Hérissey the so-called "galactine" which Muentz isolated from the seeds of lucerne is really a mannogalactane, yielding on hydrolysis practically equal quantities of mannose and galactose. An analogous substance is yielded by fenugreek seeds, but this is less soluble in water and yields relatively more mannose and less galactose than the carbohydrate from lucerne seeds. Both these carbohydrates are hydrolyzed by seminase (which see under "Albuminoids"). They are obtained by macerating the ground seeds with excess of solution of lead acetate, removing the excess of lead with oxalic acid, and precipitating the carbohydrate from the aqueous filtrate by the addition of alcohol.—Pharm. Journ., April 7, 1900, 357; from Compt. rend., *130*, 731.

Rhamninose — Chemical Formula and Solubilities. — Charles and Georges Tanret have separated rhamninose from the mixture of rhamnose,

galactose, and rhamninose, obtained by the hydrolysis of xanthorhamnine. They find it soluble in water and alcohol, but insoluble in acetone and acetic ether, and assign to it the formula $C_{18}H_{32}O_{14}$.—Chem. News, Dec. 1, 1899, 261 ; from Compt. rend., 1899, No. 19.

Milk Sugar—Convenient Qualitative Test for Cane Sugar.—John Landin observes that the qualitative determination of cane sugar in milk sugar is readily effected by means of concentrated sulphuric acid. If this be added to pure milk sugar, a faint yellow coloration ensues and changes after a time to a light brown-red, the acid assuming a reddish color. But if the milk sugar contains even very small quantities of cane sugar, the sample rapidly becomes a dark-brown to brown-black color, and the acid assumes the same color, while in the presence of larger quantities of cane sugar the milk sugar as well as the acid becomes black.—Apoth. Ztg., March 17, 1900, 182 ; from Chem. Ztg., 1900, 211.

ORGANIC ACIDS.

New Organic Acids—Derivatives of Cyano-Succinate of Ethyl.—L. Barthe finds that two ethers are formed by acting with trimethylene bromide on sodium-ethyl cyano-succinate. One of these ethers, which is well crystallized, is saponified, and yields an acid substance answering to the formula $C_{11}H_{16}O_8$; it melts at 159–160° C., is very soluble in water, and fairly so in acetic acid, from which it eventually separates by crystallization. The other ether, which is liquid, is treated with hydrochloric acid, and the crystalline mass obtained (which contains ammonium chlorhydrate), together with the acid which has been formed, are treated with anhydrous ether. This solution, submitted to evaporation, leaves a crystalline residue, which is easily purified by a further recrystallization. This acid melts at 143–144° C., is soluble in ether, alcohol, acetic acid and water ; it corresponds to the formula $C_8H_{12}O_6$, and is tribasic.—Chem. News, Aug. 4, 1899, 59 ; from Bull. Soc. Chim. (3) *21*, No. 5.

Solanthic Acid—A New Acid from the Sunflowers.—W. Braeutigam has isolated from the flowers and stems of *Helianthus annuus* a new acid, which, to distinguish it from the helianthic acid previously isolated from sunflower (seeds? Rep.) by Ludwig and Kromayer, he has named solanthic acid. It appears to exist in the plant in the form of a calcium salt, occurs in crystals which are soluble in alcohol, ether and water, nearly insoluble in chloroform and insoluble in benzin. It is odorless, has an acid taste and dissolves the carbonates of potassium, sodium and calcium, under evolution of carbonic anhydride, forming clear solutions. The salts of the alkalies are crystallizable and readily soluble in water : the calcium and barium salts are also crystalline, the latter being apparently less soluble than the calcium salts. Analysis leads to the formula $C_9H_{10}O_{10}$.—Pharm. Ztg., Sept. 9, 1899, 638.

Manganese Oxalate—Methods of Preparation. According to Deniges the formation of manganese oxalate from citric acid and potassium permanganate may be effected as follows: Dissolve 300 grams of the acid in 600 of water, cooled to 15°–16° C., and pour into a solution of 90 grams of potassium permanganate in 3000 of water, similarly cooled, the mixture being surrounded by water of a temperature of 10°–12° C. The mixture quickly changes color and evolves abundance of carbon dioxide; the temperature rises, but should not be allowed to exceed 30°–35° C. When gas ceases to be given off, the liquid should be rapidly cooled to 25°–28° C., and then set aside for four or five days. It will then be found that a plentiful crop of crystals has formed, and that the acetone-carbonic acid, which was at first present in the mother liquor in considerable quantity, has totally disappeared. On washing the crystals by decantation, and drying over sulphuric acid, they will be found to consist of two forms. Some much larger rose-colored prisms may be easily picked out from the smaller groups of white hexagons. The former on analysis are found to contain 3 molecules of water, the latter 2 molecules. The larger crystals may be obtained direct by the double decomposition in the cold of solutions of ammonium oxalate and manganese sulphate, acidulated with acetic acid; and the small hexagonal form by the same means, employing boiling solutions. It is evident, therefore, that in the case of the citric acid mixture the smaller, less hydrated crystals are deposited first from the tepid solution; the larger, tryhidrated prisms are more slowly deposited in the cold liquid.—Drügg. Circ., May, 1900, 91; from Journ. de Pharm. (6), xi., No. 3.

Stannic Oxalates—Preparation and Characters.—According to M. Platsch a saturated solution of potassium binoxalate will dissolve large quantities of freshly precipitated stannic hydrate, and after filtration deposits

Potassium-Tin Oxalate in crystals, having the composition $3K_2O.2SnO_2.7C_2O_3 + 5H_2O$. This compound forms a clear solution with water and may be recrystallized without decomposition. The corresponding sodium and ammonium salts could not be obtained; but if a solution of the potassium salt is treated with an equivalent quantity of barium chloride,

Barium-Tin Oxalate separates in the form of white needles, which are nearly insoluble, and have the composition $2BaO.SnO_2.4C_2O_3 + 8H_2O$. —Apoth. Ztg., Aug. 5, 1899, 469; from Ztschr. Anorg. Chem. 1899, *20*, 308.

Glacial Acetic Acid—Simple Test of Strength. — F. H. Alcock observes that it is difficult to obtain glacial acetic acid of correct B. P. strength, and that the official tests, melting point and specific gravity are of no

practical value. If, however, an equal volume of oil of turpentine, B. P., be added to it, this constitutes a simple test. As glacial acetic acid is required to dissolve an equal volume of oil of turpentine, so an equal volume of oil of turpentine should dissolve an equal volume of glacial acetic acid, and this is a useful additional test, and might have a place in the B. P.

Vinegar—New Acidimetric Method, Particularly Applicable for the Colored Article.—Durien has found the following method of acidimetric estimation to give good results with colored vinegar: Two solutions are prepared: 1. Sodium carbonate, at 5 per cent.: 2. Glacial acetic acid, at 7 per cent. The apparatus required is: A tube graduated in tenths of a Cc., as used in Esbach's method for the estimation of urea, and a 1 Cc. pipette. 6 Cc. of the alkaline solution are first poured out, so as to have an excess of bicarbonate; then 6 Cc. of alcohol at 95 per cent., the liquids not being mixed; we then add 1 Cc. of the acetic liquor; the total volume then measures twelve divisions: close the tube with the thumb, and shake. When the reaction is finished, the tube is placed in a vessel full of water, and shaken as in estimating urea; the second reading is 19.5, for example. A similar operation is effected with the vinegar under examination, after making quite certain that it does not contain any acetic acid, and a second reading is obtained, say 18.4; by a simple calculation the proportion of acid is found to be 59.70 Gm. per liter. The advantages of this method are that no new apparatus is required and it is of great sensitiveness; it is, however, of great importance that the liquids be accurately measured, and, above all, the alcohol must not be replaced by water.—Chem. News, April 27, 1900, 203; from Jour. de Pharm. (6), xi., No. 1.

Commercial Acetates — Estimation and Separation of Acetic, Propionic, Butyric and Formic Acids — K. R. Haberland calls attention to the importance of knowing the proportions of the homologues of acetic acid occurring in the commercial acid and its compounds, and that the methods so far known are faulty. He describes the experiments upon which he has based a satisfactory separation and estimation of the four acids—acetic, propionic, butyric and formic — which is briefly as follows: The acids are liberated from their combination by phosphoric acid, distilled with steam and the distillate evaporated to dryness in the presence of lead oxide. On treatment of the residue of evaporation with cold water, the filtrate contains the lead salts of all of the acids; but upon heating the filtrate to boiling, the propionic acid is precipitated as basic lead propionate, and from this the propionic acid is readily obtained by distillation with phosphoric acid. The lead compounds in the remaining filtrate are next decomposed with sulphuric acid, the lead sulphate is removed by filtration (the filtrate is saturated with zinc oxide ? Rep.), and the solution evaporated to dryness. On treating this residue of evaporation with absolute alcohol, zinc formate (and sulphate) remain undissolved, while

zinc acetate and zinc butyrate enter into solution. The alcoholic solution being then evaporated to dryness, the residue yields a mixture of acetic and butyric acids on distillation with phosphoric acid. On treatment of the distillate with silver carbonate, the silver salts of acetic and butyric acid are obtained, and these are separated by the greater solubility of the silver acetate over the silver butyrate.—Pharm. Review, July, 1899, 314; from Ztschr. and Chem., *38*, 217.

Chromic Acetates—Isomeric Forms.—A. Recoura finds that there are four isomers of chromic acetate, viz.: Normal chromic acetate, violet mono-acid acetate, violet di-acid acetate, and green mono-acid acetate. He considers that only one of these, the

Normal Chromic Acetate, is an ordinary metallic salt. In the others the chromium is not precipitated by an alkali, since it exists, not in the basic form, but as an acid radical. Since the normal acetate rapidly passes, in aqueous solution, into the other forms, it is prepared in the solid form by treating chromic hydrate with an equivalent of glacial acetic acid, and drying the crystalline acetate thus formed. This normal acetate is a grayish lilac substance, giving a yellowish green solution in water, which, however, soon passes into violet or abnormal di-acid acetate. To obtain the

Violet Mono-acid Chromic Acetate, this violet aqueous solution of the normal acetate is evaporated spontaneously over sulphuric and glacial acetic acids. A crop of small, brilliant violet crystals results, which, although they have the same ultimate composition of the normal acetate ($Cr(C_2H_3O_2)_3,H_2O$), differ from that body in their characters. Exposed to the air they gradually lose a molecule of acetic acid; with alkali in the cold no precipitate of chromic hydrate is produced, and of the three acid radicles in the molecule, only one can be replaced either by acids or alkalies. The

Violet Di-Acid Chromic Acetate (or Chromo Diacetic acid), $Cr(C_2H_3O_2)(C_2H_4O_2)_2$, is obtained by allowing the solution of the normal chromium acetate to stand a few hours. It has not yet been isolated in the solid state, since on evaporation (as indicated in the previous paragraph) it rapidly passes into mono acid chromic acetate. But by prolonged keeping of the violet solution of chromic acetate, it gradually assumes a green color, and on spontaneous evaporation yields

Green Mono-Acid Chromic Acetate, $2\,[Cr(C_2H_3O_2)_3]H_2O$. The same compound is, moreover, readily formed by boiling solutions of chromic acetate with acetic acid and evaporating spontaneously. It is regarded as a polymer of the violet mono acid chromic acetate.—Pharm. Journ., Sept. 2, 1899, 219; from Compt. rend., *129*, 208–290.

Acetone—Occurrence in Various Plants.—P. van Romburgh, of the Botanical Gardens at Buitenzorg, Java, has observed the occurrence of acetone in different plants. So in several euphorbiaceous plants, yielding

caoutchouc, notably *Hevea brasiliensis*, *Manihot Glaziovii* and *M. utilissima*, and in *Phaseolus lunatus* (leguminosæ). In these it appears to be associated with hydrocyanic acid, but it must not be concluded that this is essentially co-existent with the acetone, since the latter was also found in

Erythroxylon Coca and several other plants which contain no hydrocyanic acid. The author considers it probable that in these plants the acetone exists in combination with a glucoside from which it is separated by hydrolysis by the action of an enzyme and water.—Apoth. Ztg., Aug. 2, 1899, 459.

Lactic Acid—Preparation from Sour-krout Liquor.—W. Beckers has patented a process for preparing lactic acid from the liquors accumulating in the sour-krout factories, which are commonly run off and wasted. The liquor is neutralized with lime, filtered to remove albuminoids, evaporated to $\frac{1}{20}$ of its original volume, and set aside to crystallize. Calcium lactate containing 5 Mol. of water crystallizes out, but requires washing with a little water to remove sodium chloride, and under circumstances may require recrystallization. The lactate so obtained is easily dissolved in 9 parts of cold water, its solution is decomposed with the necessary quantity of sulphuric acid, and the liberated lactic acid purified in the well-known manner.—Apoth. Ztg., July 5, 1899, 400.

Calcium Lactophosphate—Variable Commercial Character.—Thos. S. Barrie reports the results of an examination of three samples of commercial calcium lactophosphate as shown in the following table:

	No. 1.	No. 2.	No. 3.
Free Lactic Acid	44.8	40 8	35.8
Calcium Phosphate	12.3	17.0	15.1
Calcium Lactate	40.0	42.2	49.9
Moisture	0.8	0.6	——
	99.9		

The compound usually occurs in lumpy masses somewhat resembling a very coarsely granulated effervescent citrate. It is very acid, hygroscopic and dissolves partially in water, leaving a more or less abundant residue. The percentage of calcium lactate was obtained by subtracting from the total calcium oxide found the amount in combination as phosphate and calculating the remainder into calcium lactate.—Pharm. Journ., March 3, 1900, 228.

Benzoic Acid—Industrial Production from Coal Tar.—According to a recent French patent, pure benzoic acid is obtained from coal tar as follows: The light and medium oils of coal tar are fractioned in a suitable

apparatus so that a fraction boiling as nearly as possible between 160° and 240° C. is obtained, such being used also for the production of phenol and cresol. These latter are removed by washing in the cold with soda solution of sp. gr. 1.10; the residual oil is transferred to a jacketed still, provided with a stirring apparatus and capable of being heated both directly and indirectly with steam. Soda solution of sp. gr. 1.40, in quantity twice that of the oil, having been added, the stirrer is set in motion, and steam is admitted as long as ammonia is given off, the products of the distillation being collected by the aid of a condenser of suitable construction. This operation is ended in a few hours, considerable quantities of ammonia water and the lower boiling constituents of the oil being found in the receiver. The contents of the still will separate into two layers; the lower aqueous layer is separated from the upper oily layer, and treated with carbonic acid or a mineral acid in order to saturate the excess of soda used. This treatment causes a further separation of phenol, of resinous and of oily bodies, the removal of which leaves a nearly water-clear solution of almost chemically pure sodium benzoate, from which the benzoic acid is readily obtained by precipitation with a stronger acid.—Apoth. Ztg., March 3, 1900, 150; from Chem. Ztg., 1900, 177.

Hydrocinnamoïn—Production and Properties. — J. Thiele has obtained hydrocinnamoïn by reducing cinnamic aldehyde by means of zinc powder, copper plated with solution of cupric sulphate. Hydrocinnamoïn, so obtained, has the composition $C_6H_5.CH:CH.CH(OH)CH(OH)CH:CH.C_6H_5$, and crystallizes in white needles, difficultly soluble in alcohol and ether, fusible at 153–154° C. Hydrocinnamoïn reduces permanganate; in acetic solution it takes up bromine; heated with acids, or above its fusion point, it gives resins the same as when it is treated with an alcoholic solution of potash. It is with difficulty attacked by acetic anhydride. Dissolved in pyridine it furnishes, by the action of chloride of acetyl, a diacetate which crystallizes in alcohol in small white prisms, fusible at 118–119° C. Its dibenzoate, prepared in an analogous manner, occurs in fine colorless needles, fusible at 169–170° C.— Chem. News, Feb. 16, 1900, 83; from Berichte, xxxii., 1296.

Salicylic Acid—Determination in Presence of Citric Acid.—In the course of an examination of lemon juice, O. Langkopf found that salicylic acid present failed to give the well known reaction with ferric chloride, the production of the violet color being prevented by the citric acid, and that the reaction is also prevented by tartaric acid. It is necessary, therefore, to extract the salicylic acid from the suspected juice by shaking it with a mixture of ether and petroleum-ether. The salicylic acid may then be determined in the residue of evaporation. Ether alone will not answer, since this dissolves citric acid also.—Pharm. Centralh., 1900, 335.

Referring to the foregoing, Conrady observes that the shaking out with petroleum ether and ether is superfluous, since the reaction of salicylic

acid with ferric chloride or any other ferric salt is readily obtained in the usual way in the lemon juice, if the *ferric* condition of the iron salt is maintained. This is accomplished by adding a drop of nitric acid or of hydrogen dioxide, whereby any ferrous salt that may have formed is restored to the ferric condition. The author suggests that the failure of the reaction, if any, may be due to the formation of a double salt in the presence of citric or tartaric acid, in which the iron is combined in a ferrous condition.—Apoth. Ztg., June 20, 1900, 412.

Salicylic Acid—Reaction with Hydrogen Peroxide.—W. E. Ridenour, endeavoring to bleach some sodium salicylate by means of hydrogen peroxide, found that a beautiful cherry-red color was developed instead of the expected whiteness: He finds in this a possible test of some utility for the presence of salicylic acid. In order to develop the color, however, the presence of ammonium carbonate is necessary, and the solution of hydrogen peroxide must not exceed a strength of 2.301 volumes of available oxygen. If 1 Cc. of a 10 per cent. solution of sodium salicylate is diluted with 99 Cc. of water and then mixed with 15 Cc. of solution of hydrogen peroxide of the strength mentioned, and 5 Cc. of solution of ammonium carbonate U. S. P., a cherry-red color manifests itself. This reaction is modified to a greater or less extent by the presence of other salts, as shown in a table given by the author. The limit of this reaction appears to be 1 part of the acid in 2083 parts of water.—Amer. Journ. Pharm., Sept. 1899, 414–416.

Salicylic Acid—Use for Preservation of Fruit Juices.—In an address before the Society of German Fruitjuice Producers, Dr. Bein expressed the decided opinion that salicylic acid in small doses, such as are employed in the preservation of food products, is perfectly harmless. In the absence of legal prohibition, he considers it perfectly proper to add as much as 0.5 Gm. of salicylic acid to a kilogram of fruit juice, and even 1 Gm. per kilogram in the case of concentrated (condensed juice), in which the larger proportion may even be necessary in order to overcome the tendency of albuminoids present to undergo decomposition.—Apoth. Ztg., July 29, 1899, 449.

Sodium Salicylate.—Formation of very soluble double compounds with *Strychnine Salts*, which see under "Organic Bases."

Salicylates of the Rare Earths—Preparation.—According to the specification of an English patent, several salicylates of the rare earths are obtained by one of the following methods: By double decomposition between a soluble salicylate and a salt of the rare earths (didymium or lanthanum), or by direct reaction of salicylic acid upon the hydrate or carbonate of the rare earth.

Didymium Salicylate is so obtained as a pale red powder. Both salicylates are insoluble in water, and are recommended as antiseptics.—Chem. Ztg., 1899, 910.

Ferric Salicylate.—Use as indicator in volumetric determinations of *Borates*, which see under "Inorganic Chemistry."

Bismuth Salicylate—Properties and Composition of the Commercial Salt. —Lyman F. Kebler, with the view to determine the extent to which the basic bismuth salicylate of commerce varies in its composition, has subjected seven samples obtained from various sources to examination. He found them to contain 63.51, 64.15, 66.20, 64.36, 64.50, 63.42, and 61.60 per cent. of Bi_2O_3, respectively. They were all acid in their reaction; two of them contained considerable nitrate, the others only traces, and they all contained traces of chlorides and small percentages of moisture—the latter varying from 0.15 to 0.76 per cent. Under the microscope all the salts appeared crystalline and amorphous, five of them appeared white and bulky in mass, one bulky with a pinkish tint, the other is described simply as having a pinkish tint. The author sums up the characters and properties of bismuth subsalicylate, suitable for medicinal use, as follows: A white or pinkish-white, micro-crystalline-amorphous powder, nearly odorless and tasteless, insoluble in water, alcohol and glycerin, but slowly decomposed by these liquids. On igniting 1 Gm. in a porcelain crucible, from 0.62 to 0.64 Gm. of residue should be left, corresponding to 62 to 64 per cent. of bismuth oxide. Under proper tests—described by the author —not more than traces of chlorides, sulphates, nitrates or arsenic should be revealed.—Amer. Jour. Pharm., Feb. 1900, 66–69.

Bismuth Salicylate—Precaution to be Observed in Dispensing It. — The normal bismuth salicylate, $C_6H_4OHCOO.BiO$, having been admitted into the B. P., Geo. Roe calls attention to the fact that there are several kinds of bismuth salicylate, and makes some observations on the precautions to be observed in dispensing it. Bismuth salicylate is a salt the components of which are so loosely combined that they are dissociated on the addition of water. The B. P. states that it is insoluble in water and alcohol, and that it should not give a violet color with ferric chloride; it is, however, considerably darkened in the latter case, and the filtrate from a mixture of the salicylate with water becomes intensely violet on the addition of the test-solution. Bismuth salicylate is sometimes prescribed with sodium bicarbonate. Such a combination is incompatible, sodium salicylate and bismuth carbonate resulting with effervescence, which takes place gradually, much in the same way as when bismuth subnitrate and sodium bicarbonate are mixed with water. In such cases it is best to dispense with hot water, and thus facilitate the change, otherwise it is possible the bottle may burst, much to the discomfort of the patient. Bismuth salicylate is soluble in potassium citrate after standing a short time; and, to help matters, the application of a little heat is advisable, so that it may form the clear solution before it is finished off at the dispensing-counter. It is also soluble in solution of ammonium citrate. It should not be dispensed with iodides, as it changes to a brick-red color in the same way as the sub-

nitrate does under the same conditions. — Chem. and Drugg., July 1, 1899, 22.

Acetyl-Salicylic Acid—Tests of Identity and Purity.—Dr. F. Goldmann proposes the following tests for the identification of acetyl-salicylic acid (= salicylic acid, in which the hydroxyl-hydrogen is replaced by the acetyl-group), which has been introduced under the trade name of

Aspirin.—It melts at 135° C. If 0.5 Gm. is boiled from 2 to 3 minutes with 10 Cc. of 10 per cent. sodium hydrate solution, it is completely saponified and a clear solution results on cooling. If diluted sulphuric acid is then added to the solution, salicylic acid is precipitated with transient violet coloration. The salicylic acid is collected by filtration, and identified by solution in ether, melting point, reaction with ferric chloride, etc., while the filtrate is characterized by an acetic acid odor, and by developing the odor of acetic ether when boiled with alcohol and sulphuric acid. To determine the purity of aspirin—absence of free salicylic acid—0.1 Gm. is dissolved in 5 Cc. alcohol and the solution diluted with 20 Cc. water. The addition of 1 drop of diluted ferric chloride solution should not produce a violet color.—Pharm. Ztg., Oct. 14, 1899, 733.

Ferrum Arsenico-Citricum Ammoniatum—A New Antiperiodic.—Valvassori and Peroni have found a compound of ammonio-citrate of iron and arsenic to be a valuable antiperiodic, which is particularly useful for subcutaneous treatment in cases of children. The solution for this purpose is prepared by dissolving 0.35 Gm. in 10.0 Gm. of sterilized distilled water, 1 Cc. of which corresponds to 0.5 milligram of the preparation. This is supplied in the form of green, extremely soluble scales, containing 1.4 per cent. of arsenous acid, and from 15 to 18 per cent. of iron, calculated as metal.—Pharm. Centralh., April 5, 1900, 205; from E. Merck's Berichte, (Darmstadt), Jan. 1900.

Malic Acid—Determination in Presence of Tartaric Acid.—Dr. Hilger and H. Ley, experimenting with malic acid obtained from various fruits, such as mountain ash berries, barberries, ripe and unripe grapes, etc., find palladinous chloride a convenient agent for its quantitative determination in the presence of tartaric acid, etc. All the normal constituents of wine, with the single exception of glycerin, fail to exert a reducing action upon alkaline palladinous chloride, while malic acid reduces a 2 per cent. faintly alkaline or neutral solution of the latter completely within 10 minutes. The metal is collected in Allihn's asbestos filter tubes and weighed. The wine is evaporated to about one-fifth its original volume, the acids are precipitated by lead acetate, liberated from the precipitate by H_2S or CO_2, and then subjected to the test in a faintly alkaline solution.—Apoth. Ztg., Sept. 27, 1899, 575.

Perezol (Pipitzahoic Acid)—A New Vegetable Indicator.—Duyk has found pipitzahoic acid, also called by the shorter name "perezol" derived

from the botanical name of the plant, *Perezia adnata*, Gray, from which it is obtained. This acid forms well formed crystals of an orange-yellow color, not very pleasant odor, melting at 67° to 70° C., and subliming at 100° in form of very delicate prismatic crystals. The acid is very sparingly soluble in cold water, somewhat more in boiling water, but readily in alcohol, ether, benzin and oils. It unites with bases and metallic oxides to form violet-black salts, a property which makes it a very valuable indicator in alkalimetric operations, since it affords a distinct and sharp reaction even in the weakest alkali solutions. Even with ammonia the end of the reaction shows up clear and distinct, there being no period of transition manifested. A drop of its alcoholic solution 1 : 200 produces a distinct color reaction in water containing half a drop of decinormal soda solution, aniline or pyridine, and even ordinary drinking water is colored malva-red by the reagent, while distilled water that has been boiled in a glass flask becomes rose-red from the presence of the minute traces of alkali dissolved from the glass. By the action of acids the colors produced are discharged and the liquids become colorless; this reaction being quite as delicate and sharply defined as the development of color. The author regards the new indicator to be serviceable not alone for ordinary alkalimetric operations, but more particularly for the titrimetric methods of the determination of alkaloids.—Pharm. Post, Dec. 31, 1899, 739.

Embelic Acid—Characters and Constitution.—Dr. Heffter and W. Feuerstein have subjected embelic acid, first obtained in 1888 by Warden from the fruits of *Embelia ribes*, to nearer chemical investigation. It is readily obtained to the amount of 2.5 per cent. by treating the drug with ether, forming orange-red tabular crystals, which melt at 142° C. It forms dark red crystalline salts with the alkalies, which are however decomposed even by carbonic acid, and forms colored, amorphous compounds with the alkaline earths and heavy metals. Elementary analysis leads to the formula $C_{15}H_{26}O_4$. The formation of a dibenzoyl compound establishes the presence of two hydroxyl groups. With amines, such as methylamine, aniline, toluidine, etc., embelic acid forms well crystallized compounds which possess extraordinary stability. Thus, the aniline compound is not decomposed until after boiling for hours with alcoholic sulphuric acid. By the action of nascent hydrogen, embelic acid is converted into dihydro-embelic acid, which crystallizes well and is colorless. By oxidation it forms, besides large quantities of formic acid, a colorless acid melting at 43° C., which proves to be identical with laurinic acid. Embelic acid is not a true acid, but a double substituted dioxyquinone.—Apoth. Ztg., Sept. 23, 1899, 565.

Tannin — Determination by the Aid of Safranin. — L. Specht and F. Lorenz recommend a method for the estimation of tannin which depends upon its precipitation with safranin as a tannin-antimony lake and the re-

ducibility of the uncombined safranin by means of hyposulphite. The tannin material is precipitated with tartar emetic and a known quantity of safranin, both in excess, and the excess of safranin is titrated with hyposulphite solution, the titre of which is adjusted to safranin. The amount of safranin consumed is determined by the difference, and the amount required for the tannin is ascertained by a blank experiment made with tannin of known purity. To avoid the interfering action of oxygen, the distilled water used throughout the process must be previously boiled, while the hyposulphite solution must be freshly prepared, as required, ammonium hyposulphite, for the preparation of which specific directions are given (see *Ammonium Hyposulphite* under "Inorganic Chemistry"), being found to possess the greatest stability.—Pharm. Ztg., April 7, 1900, 266; from Chem. Ztg., 1900, No. 17.

Chloral-Tannin — Preparation and Characters. — Harold Wilson describes a condensation product of tannin and chloral which he prepared at the request of a physician, and which is now frequently used in hospitals. To prepare it, chloral hydrate and tannin (proportions not given. Rep.) are mixed, heated in a porcelain capsule on a water-bath, when, at 60° to 70° C., a resinous-looking substance separates out, and may be caused to aggregate by stirring, being then easily removed from the brown liquid associated with it. It is allowed to cool in a desiccator, and may then be powdered for convenient dispensing. Chloral-tannin, the name given to this product, is soluble in water and in alcohol, and yields 38 per cent. of chloroform when its solution is treated with potassium hydroxide. —Pharm. Journ., Aug. 5, 1899, 148.

α-Digallic Acid—Identity with Tannin.—Flowitsky has shown that tannin is dextrogyre, $^{a}/_{D} = + 60°$, in aqueous solution. P. Walden is of opinion that tannin is not a definite compound, but a mixture containing a compound in variable proportions, with a higher rotatory power, $^{a}{}_{D} = - 75°$; α-digallic acid is, on the contrary, inactive; further, it softens at 120° and decomposes at 150° C., while tannin melts at 110°–115° C. After considering various properties, the author concludes that tannin and α-digallic acid are altogether different bodies.—Chem. News, Oct. 13, 1899, 183; from Berichte.

Bismuth Subgallate—Chemical Composition and Properties.—Lyman F. Kebler, member of Research Committee E, Pharmacopœia Revision, observes that there are few chemicals around which there clusters so much that is interesting as bismuth subgallate. It was prepared, described, analyzed, and a chemical formula assigned to it by H. Bley, in 1841, but evidently lost sight of until fifty years later (in 1891) B. Fischer prepared the same substance by essentially the same process. It is, therefore, all the more astonishing that patents should be granted in 1897, both in France and the United States, for the preparation of this product, the lat-

ter, to A. Liebrecht, covering not only the process of manufacture, but the chemical product itself, even to the per cent. of bismuth it contains. Bley's product was found by him to contain 51.48 per cent. of bismuth oxide. Under the French patent it is stated to contain 50.4 per cent. of bismuth, theoretically, or 49.4 per cent. in practice, and the claim of the American patent is the same. Following Bley's original method and directions, Mr. Kebler obtained a product containing 53.81 per cent. of bismuth oxide, and this agrees well with the percentages found in ten commercial samples, bismuth subgallate being now manufactured by manufacturers of chemicals generally, notwithstanding the fact that the patent has not yet been officially annulled, as it doubtless should be. The lowest percentage of bismuth oxide found in these samples, which include "Dermatol," was 52.73 per cent., the highest, 54.63. The formula assigned by B. Fischer and B. Grützner—$C_6H_2(OH)_3.CO_2.Bi(OH)_2$—is in close accord with Mr. Kebler's investigations. This formula requires the subgallate to contain 54.33 per cent. of bismuth oxide, the variations from 52.73 to 54.63 per cent. found being doubtless due to different degrees of hydration. The compound is characterized by the author as follows:

Bismuth subgallate is a soft, light yellow, generally amorphous powder of a somewhat variable composition (but may have some microscopic crystals), without odor or taste and permanent in the air; indifferent to light and may be sterilized at 100° C.; insoluble in water, alcohol, ether or dilute acids; soluble in solutions of the fixed alkalies and strong inorganic acids. When incinerated in a porcelain crucible the residue may vary from 53 to 55 per cent. Neither alcohol nor ether should remove anything. One gramme, calcined in a porcelain crucible and dissolved in dilute sulphuric acid, should not give any indication of arsenic with Marsh's apparatus.—Amer. Jour. Pharm., July 1899, 326–332; Proc. Penna. Pharm. Assoc., 1899, 182–188.

ORGANIC BASES.

Alkaloids—Historical Review of their Constitution.—A. R. L. Dohme contributes an interesting historical review of the alkaloids with particular reference to the developments that have been made from time to time concerning their constitution and chemical structure. Having lucidly explained the work that has been accomplished in this direction up to the present day, the author remarks that the continued activity manifested in studying the constitution of alkaloids justifies the prediction that within the next twenty years the constitution of every alkaloid will be known definitely. The question as to the advantage of all this structural work to pharmacy is met by the answer that the advent of each established fact means another step towards possibly improved medicaments, not to mention possibly greatly cheapened drugs. When morphine, for instance, shall be constitutionally known, its synthesis from phenanthrene is within the range

of possibility, and with this comes the ultimate reduction of its price to that of quinine, or, perhaps, less. To pharmacology it means a step in case of each alkaloid towards the attainment of ideal medication—medication with one specific effect and not with accompanying side effects. To chemistry it marks in each case, as a fact established, a milestone for the guidance of subsequent workers, and chronicles the existence of another truth.—Amer. Jour. Pharm., Jan., 1900, 9–25.

Alkaloids—Simple Alkalimetric Method of Estimation.—H. M. Gordin and A. B. Prescott observe that while from a theoretical point of view, one of the best methods of estimating alkaloids is undoubtedly the alkalimetric estimation of their basicity, the weakness of their basicity is often so great as to cause acids combined with them to react upon most indicators, and particularly phenolphthalein, as if the acids were free. The end reaction, unlike that with sulphuric or hydrochloric acids and standard alkali, is therefore indefinite and of very little practical value. A simple improvement of the method, however, makes it possible to estimate all alkaloids capable of forming salts with as much sharpness as is obtained in inorganic alkalimetric analysis, and admits of the use of phenolphthalein as indicator in all cases where carbonates, etc. are absent. This consists in taking up the alkaloid in an *excess* of standardized mineral acid : then precipitating the alkaloid with a slight excess of some delicate reagent like Mayer's or Wagner's, making up the mixture to a definite volume, and filtering off one-half of this after the precipitate has formed completely. In this filtrate the excess can then be accurately determined by the use of standard alkali and phenolphthalein as indicators. In case Wagner's reagent is used, the filtrate must first be decolorized with sodium thiosulphate. Whatever the composition of the precipitate with regard to mercury or iodine may be, the alkaloid always falls as a salt and therefore takes up an amount of acid which is equivalent to the combining weight. Hence, on deducting the excess of acid as determined alkalimetrically from the total quantity of acid employed, the amount combined with the alkaloid is at once ascertained, and from this the amount of alkaloid is readily calculated. In order to obtain the best results, the acid and alkali should be standardized for each alkaloid by a weighed quantity of that alkaloid, and proceeding as explained.—Pharm. Review, Nov. 1899, 495–496 (see also Pharm. Arch. *2*, 313).

Alkaloidal Assay—Improved Process Applicable to Fluid Extracts.—A. B. Lyons, referring to the well-known difficulty experienced by emulsionizing during the "shaking out" process required in the alkaloidal assay processes usually employed, observes that in the case of fluid extracts this tendency to emulsionize may be generally overcome by adding to the fluid extract in the first instance a certain quantity of dilute alcohol, and repeating such addition whenever in the course of the operation the fluid becomes inconveniently thick. It is to be understood, of course, that the

impure alkaloid separated in this way is to be subsequently extracted from the ethereal solvent with acidulated water, from which in turn it is to be finally taken out in a relatively pure state by a second shaking out with ether. In the

Assay of Astringent Extracts, such as cinchona, for instance, the author advises the intervention of ferric chloride (or lead subacetate) substantially as follows: Add 2 Cc. of the fluid extract to 40 Cc. of strong alcohol (to which, if deemed advisable, a few drops of 40 per cent. acetic acid may be added); follow this by 2 Cc. of a 12 per cent. alcoholic solution of ferric chloride, mix well, and add 2 Cc. of solution of ammonia, and as much more as may be necessary to produce an atmosphere of free ammonia, sensible to litmus, in a flask of 50 Cc. capacity, after thorough shaking. Fill the flask with strong alcohol to the 50 Cc. mark, shake vigorously, let stand one hour, filter off 25 Cc., evaporate to small bulk, add 5 Cc. of water and enough 10 per cent. hydrochloric acid to distinct acidity, and heat to drive off any remaining alcohol. Then transfer the liquid to a separator, rinsing with several portions of 1 Cc. of acidulated water, and shake out with successive portions of 10 to 15 Cc. of ether to remove fat or waxy matter. Finally, render alkaline with ammonia and shake out with ether in the well-known way.

If solution of lead subacetate is used in place of ferric chloride, 2 Cc. each of the fluid extract and lead subacetate solution are added to 46 Cc. of strong alcohol, filling exactly to the 50 Cc. mark, and the mixture is well shaken. The filtrate is treated with dry sodium carbonate to remove excess of lead, again filtered, and 25 Cc. of this final filtrate is then further subjected to the assay as in the first case.—Pharm. Review, Dec., 1899, 558–560.

Alkaloids—Acidimetric Titration with Ammoniacal Cupric Oxide.—E. Falières has employed an ammoniacal solution of cupric oxide with advantage for the acidimetric titration of alkaloids. The method is based upon the fact that as soon as the last trace of uncombined acid is saturated, a distinct turbidity is produced in a solution of the alkaloid, prepared by dissolving 0.10 Gm. in 20 Cc. of $\frac{N}{10}$ sulphuric acid. The reagent is prepared by dissolving 10 Gm. of cupric sulphate in about 500 Cc. of water, adding ammonia until the initial precipitate is redissolved, and then enough water to make 1000 Cc. The test is made in a glass vessel placed against a black background, the standard copper solution being then run in until permanent turbidity results. In the case of cinchona, the total alkaloid may be determined in the first extraction, since the accompanying impurities do not affect the appearance of the cupric oxide precipitate.—Pharm. Journ., Sept. 23, 1899, 295; from Compt. rend., *129*, 110.

Alkaloids — Silico-Tungstic Acid a Good Reagent. — Gabriel Bertrand has found silico-tungstic acid, in the form of its alkali salts, to be an excel-

lent reagent for alkaloids. It forms with them well defined, completely permanent salts. A 5 per cent. solution of the acid—$12WO_3.SiO_2.2H_2O$—produces in sufficiently concentrated, cold solutions of alkaloid salts precipitates, which are generally flocculent, sometimes pulverulent, and even crystalline, and are either white or yellow in color. They are nearly insoluble in cold water, sparingly soluble in boiling water, and have the general formula $12WO_3.SiO_2.2H_2O.4$ Alkaloids + nH_2O. They seem to be capable of forming two hydrates—the one initially on precipitation in the cold, the other when the liquid is heated after the precipitate has formed, or if the precipitation is effected with aid of heat. Some of the hydrates formed under the influence of heat are extremely fine powders, and more readily visible than those obtained by precipitation in the cold, while in other alkaloidal precipitates no difference can be observed. This enables their division into two groups, showing the relative sensitiveness of the reaction with different alkaloids, the first group being that in which there is no difference between the hydrates obtained in the cold or by the aid of heat.

I. Group.		II. Group.	
Coniine	1 : 8000	Aconitine	1 : 80000
Morphine	1 : 16000	Veratrine	1 : 130000
Theobromine	1 : 18000	Brucine	1 : 150000
Nicotine	1 : 20000	Strychnine	1 : 200000
Narceine	1 : 30000	Narcotine	1 : 200000
Codeine	1 : 40000	Quinine	1 : 500000
Atropine	1 : 50000	Quinidine	1 : 500000
Caffeine	1 : 50000	Cinchonine	1 : 500000
Cocaine	1 : 200000	Cinchonidine	1 : 500000

From the precipitates obtained under the conditions of the test the alkaloids can be readily separated in a free state by decomposing them with dilute alkalies, even ammonia decomposing them readily in the cold.—Apoth. Ztg., Sept. 6, 1899, 535; from Compt. rend., *128*, 742–745.

Alkaloids—Selenous Acid a Sensitive Reagent.—Dr. Mecke finds a solution of selenous acid (0.5 Gm.) in concentrated sulphuric acid (100 Gm.) to be an exceedingly sensitive reagent for alkaloids. He gives the following reactions obtained with pure alkaloids obtained from Merck.

	In the Cold.	When Heated.
Aconitine, pur. pulv.	nearly colorless, yellowish.	light brown-violet.
Aconitine, German	" " "	" "
Aconitine, pur. cryst.	colorless.	" "
Apomorphine	dark-blue violet.	gradually dark brown.
Atropine	colorless.	nearly colorless.
Brucine	yellow-red.	lemon yellow.
Cocaine	colorless.	rose-yellow.
Codeine	blue, rapidly changes to emerald green, afterward to permanent olive.	steel-blue, then brown.
Caffeine	colorless.	colorless.
Colchicine	intense lemon yellow.	yellowish-brown.
Coniine	colorless.	colorless.
Delphinine	deep red-brown.	brown.
Digitalin	yellow, immediately changing to digitalis-red, gradually fading.	blue-violet, then brown.
Morphine	briefly blue, then intensely and permanently blue-green to olive-green.	brown.
Narceine	faint greenish-yellow, then violet.	dark violet.
Narcotine	greenish-steel blue, afterwards cherry red.	cherry-red.
Nicotine	yellowish.	yellowish.
Papaverine	greenish-dark steel blue, then deep violet (methyl violet).	intensely dark-violet (methyl-violet).
Physostigmine	brownish-yellow.	faint brown-red.
Picrotoxin	nearly colorless.	yellowish-brown.
Quinine	colorless.	light-brown.
Solanine	reddish-yellow.	gray-brown.
Strychnine	colorless.	colorless.
Thebaine	deep orange, gradually fading.	dark-brown.
Veratrine	lemon-yellow, afterwards olive-green.	brownish-violet.

The reagent appears, according to the foregoing reactions, to be particularly adapted for the determination of colchicine, digitalin, veratrine, and particularly of the opium alkaloids. As regards its sensitiveness, it is mentioned that the reagent produces a distinct green color with 0.005 Mg. of morphine.—Apoth. Ztg., Sept. 6, 1899, 532; from Ztschr. f. öff. Chem., 1899, 351.

Morphine—Improved Method of Forensic Determination.—Dr. Russwurm observes that morphine is obtained only as an amorphous residue from its solution in chloroform, while in forensic determinations it is desirable that it be obtained in well-formed crystals. Following the customary method; shaking out of the ammoniacal solution with warm amyl alcohol, of the amyl alcohol solution with hydrochloric acid, and this, after adding excess of ammonia, with chloroform, well-defined crystals may be obtained by evaporating the chloroform solution to a small volume—a few cubic centimeters—and then adding a large excess of petroleum ether, 50 cubic centimeters, and setting aside covered for 24 hours. In the presence of small quantities of morphine, turbidity is produced, while a voluminous precipitate is formed when larger quantities are present. In either case

well formed crystals are obtained on standing, and the crystallization having been effected in a tared vessel, the crystals may be dried and weighed after decanting the mother liquor. The morphine being absolutely insoluble in the benzin, no loss is occasioned.—Pharm. Centralh., Sept. 7, 1899, 544.

Morphine Derivatives—Their Significance as Cough Remedies.—Dr. Alb. Fraenkel, on the basis of extensive experiments made in order to determine the pharmacological value of the morphine derivatives as cough remedies, finds that, as already pointed out by Dreser in the case of heroin, both morphine and codeine are effective in strengthening the respiration of animals, which becomes slower and deeper and thus check the inclination to cough. These effects are, moreover, produced in the smallest doses—doses which are otherwise quite ineffective—not alone by the bodies named, but by all morphine derivatives and preparations. Codeine, however, possesses this property in a marked degree, and may be given in comparatively large doses with impunity; while heroin appears to be intermediate between codeine and morphine.—Apoth. Ztg., Nov. 25, 1899, 713; from Münch. Med. Wochenschr., 1899, 1525.

Heroin—A Case of Poisoning.—The "Ailg. Med. Central-Zeitung" reports a case of poisoning by "heroin," which was given in doses of 0.167 Gm. to an asthmatic patient aged 40 years. The symptoms manifested after four hours were prominent syncope, suppression of vision, strong myosis, and abnormal temperature. The patient recovered under treatment with camphor injections in the course of three days.—Pharm. Post, Dec. 31, 1899, 743.

Codeine—Strong Basicity.—In the course of preparing a mixture containing codeine alkaloid and ammonium chloride, Prof. Henry C. C. Maisch was surprised to note the rapid solution of the codeine in a little water on adding some of the ammonium chloride. At the same time the odor of ammonia distinctly manifested itself, giving evidence of the strong basicity of codeine. While this character of codeine is recognized by some of the authorities—Schmidt, Beilstein, and others—the U. S. P. of 1890 does not so indicate in its description of the alkaloid; to the contrary, it goes so far as to state that it is neutral to litmus paper. Experiments made by Prof. Maisch prove that codeine is capable of decomposing ammonium chloride in aqueous solution, molecule for molecule, and that this property may be made available for the estimation of the codeine. The method requires the indirect estimation of the codeine from the quantity of ammonia liberated; but the author fails to show that it possesses any advantage over the direct method of titration, which, as admitted in the discussion following the reading of his paper, is equally accurate and more expeditious.—Proc. Penna. Pharm. Assoc., 1899, 149–153.

Cotarnine Hydrochloride—Properties and Physiological Relation to

Hydrastinine Hydrochloride.—The close relations of the hydrochlorides of cotarnine and of hydrastinine in so far as their chemical constitution is concerned, pointing out the probability that the two compounds might be similarly related in their physiological activity, has induced Martin Freund, who designates the cotarnine compound by the name of "stypticine," to experiment upon animals with the two bodies and, having found them relatively non-poisonous, subsequently on man. The results seem to prove a close relationship in the physiological action of the two bodies also, and that hydrastinine must be classed, like cotarnine, among the hæmostatic remedies. Recent experiments made by Dr. von Pradzynski add further testimony to the reliability and value of stypticine as a hæmostatic remedy, useful in original menorrhagia, persistent bleeding of the uterus, &c.; the maximum dose by the mouth being 2 tablets (containing 0.05 Gm.) administered up to 8 per day, or subcutaneously two doses each of 0.2 Gm. per day.

Stypticine is characterized by Freund as follows: A yellow, crystalline powder, having the composition $C_{12}H_{14}NO_4Cl$, losing only a minimum of weight when dried at 100° to 105° C. Combustible on platinum without residue; easily soluble in water, forming a yellow solution, and also in absolute alcohol when heated, but precipitated in a crystalline condition on adding ether to the latter solution. It is browned at 180° C. and decomposed completely at 191–192° C. Owing to its extreme bitterness it is marketed in the form of sugar-coated tablets.—Apoth. Ztg., July 26, 1899, 443.

Perbromides of Cinchona Alkaloids—Formation, etc.—A. Christensen observes that while the periodides of the alkaloids have long been studied and described, the corresponding bromine compounds have received very little attention. He has now prepared an entire series of the bromine compounds of the three most important cinchona alkaloids—quinine, cinchonine and cinchonidine—and describes them in the present paper. He shows that the perbromides of these alkoloids have characters which are quite distinct from periodides, inasmuch as the latter only contain hydriodic acid and freer iodine, while the bromine compounds contain bromine in three different forms: 1, the bromine is combined with the alkaloid in the same way as it is combined in ethyl bromide; 2, as hydrobromic acid; and, 3, as freer bromine. The hydrobromic acid, also, is present in two forms, inasmuch as the one-half neutralizes the alkaloid, while the other half, in combination with bromine, forms as acid perbromide, and has a different analytical reaction from the first half. Furthermore, the author has made the interesting observation that the bromine combined with the alkaloid is not substituted, but simply added. He finds that the perbromides may be easily formed if the alkaloid is dissolved in glacial acetic acid, an excess of hydrobromic acid is added, and then gradually adding bromine to the warmed liquid. On cooling the perbromide sepa-

rates out in large crystals. The composition of these perbromides is represented by the following formula: Alkaloid bromide, $2HBr.Br_2$.—Apoth. Ztg., May 2, 1900, 294; from Videnskabernes Selskabs Skrifter, 1900, 253.

Quinine — Manufacture in Java. — According to a recent British Consular Report the quinine manufactory established in Java in 1897 has been so well supplied by most of the cinchona planters, that, notwithstanding that it was enabled to deliver a half a million ounces of quinine sulphate in 1898, the capacity has since been considerably enlarged. The bulk of the Bandong manufactory's product has been shipped to London, large shipments having also been made to New York. A manufactory has also been erected on the estate of "Pandan Aroem," at Paroeng Koeda, to convert its bark into quinine, but so far the greater part of the output is said to have been sold for local consumption. — Pharm. Journ., May 12, 1900, 502.

Quinine Hydrochloride and Caffeine — Formation of a Very Soluble Compound—Drs. B. H. Paul and A. J. Cownley call attention to the tendency which alkaloids have to form compounds with each other when present together in various solvents, and to simulate a distinct alkaloid having characters quite distinct from each of the component parts. This is illustrated in a compound introduced by Dr. Kreidmann under the name of

Basicine, which, as claimed, is found by the authors to be a compound resulting from the chemical union of quinine (hydrochloride) and caffeine. This compound is more freely soluble in water than either of its components, in fact, in an equal weight of water, and analysis proves it to be made as represented by the admixture of two parts of quinine hydrochloride and one part of caffeine. Analysis showed it to contain 62.6 per cent. of the quinine salt, 33.0 per cent. of caffeine and 4.4 per cent. of water, or for the anhydrous substance, 65.5 per cent. and 34.5 per cent. respectively. But the difference in solubility is not the only distinction from the components of "basicine." The melting point is described as being at 125° C., whereas that of quinine hydrochloride is at 193° C. and that of caffeine at 225° C.—Pharm. Journ., April 28, 1900, 438.

Quinine Acetate—Composition and Solubilities.—In a recent dispensing note, D. B. Kidd had attributed the precipitate produced in solutions of quinine sulphate by ammonium acetate, not to the formation of the sparingly soluble quinine acetate but to quinine hydrate, which separates, owing to dilution of the acetic acid ions by the alkaline acetate solution. To gain some light upon the subject, J. Rutherford Hill has now made some experiments to determine the composition and solubilities of quinine acetate, obtained from Howards, who, however, were unable to give much information concerning the properties of the salt, nor could be find any published reference to it. Mr. Hill's experiments lead to the following

conclusions: The salt, having the formula $C_{20}H_{24}N_2O_2.C_2H_4O_2.H_2O$, contains, as the formula practically requires, 74.8 per cent. quinine, 19.6 per cent. acetic acid, and 5.6 per cent. water. It is soluble in 52 parts of water at 15° C.; freely soluble in hot water; in 7 parts (= 8.5 by vol.) of 90 per cent. alcohol; in 12 parts (= 8 by vol.) of chloroform; in 130 p. (= 172 by vol.) of ordinary ether; and in 390 parts (= 542 by vol.) of absolute ether. When excess of ammonium acetate solution is added to a saturated solution of quinine acetate, the liquid in a short time becomes solid, owing to formation of bulky quinine hydrate, this happening even when considerable excess of acetic acid is present. These observations appear to substantiate the accuracy of Mr. Kidd's suggestion concerning the cause of precipitation in mixtures of spiritus mindererus and quinine sulphate.—Pharm. Jour., April 21, 1900, 417.

Tasteless Quinine Tannate—New and Convenient Process.—Zeelt states that tasteless quinine tannate is more convenient, and quite as efficient as that obtained by Rozenyay's process, obtained by the following: Dissolve 100 Gm. of quinine alkaloid in 125 Cc. of 96 per cent. alcohol, place on a water-bath, and add gradually 400 Gm. of tannin, stirring until a homogeneous mixture is obtained, which is added while stirring to 3 liters of water. The precipitate is collected on a cloth, expressed, and dried at a gentle heat.—Pharm. Ztg., Feb. 3, 1900, 96; from Pharm. Weekbl., *36*, No. 36.

Cocaine Hydrochloride—Concerning the Reliability of Maclagan's Ammonia Test.—The insistent statement of Dr. F. Günther that Maclagan's reaction for the purity of cocaine hydrochloride is practically worthless because it will only occur in the presence of certain impurities, and particularly of small amounts of a foreign base melting at 111° C. (see Proc., 1899, 739), has induced Messrs. Böhringer and Sons to carefully investigate the conditions under which Dr. Günther claims that cocaine hydrochloride does or does not respond to Maclagan's test. Operating with a large quantity of coca leaves, entirely separated from their general process of manufacture, they were unable to obtain or determine either in the crude alkaloidal mixture, or in the cocaine hydrochloride obtained from this, any base having the melting point 111° C. In the mother liquors from which the cocaine hydrochloride had been crystallized, however, they found a small quantity of a foreign base melting at 104° to 105° C. The presence of an ethyl alcohol residue (cocaethylin), such as is mentioned by Dr. Günther, was also not determinable. On the basis of these results, and of a thorough re-investigation of Maclagan's reaction with cocaine hydrochloride of absolute purity, the Messrs. Böhringer declare Dr. Günther's statements to be absolutely erroneous, and insist on the retention of Maclagan's test as one of the most convenient for establishing the purity of commercial cocaine hydrochloride, as well as for the recognition of the presence of the poisonous isatropyl-cocaine. They emphasize, however,

that the dilution of the alkaloidal solution should be 0.1 : 85, and not 0.1 : 100, as employed by Dr. Günther, since with the latter the formation of a crystalline precipitate of cocaine is materially retarded.—Pharm. Centralh., June 29, 1899, 393–396.

The chemists of Zimmer & Co. have also engaged in the inquiry concerning the presence of a new base in commercial cocaine hydrochloride, melting at 110° to 111° C., and vitiating Maclagan's test, as claimed by Günther. In an experience of many years, they have never observed this base, and recent experiments made (for them ? Rep.), by Dr. C. Mezger, failed to reveal the presence of this new base — supposedly an isomer of cocaethylin — either in the by-product resulting from the manufacture of cocaine, or in the cocaine hydrochloride supplied by this firm to the trade, such cocaine hydrochloride, as well as reliable products of other manufacturers, responding admirably to Maclagan's test. As the result of their careful investigations, Zimmer & Co. emphasize that the greater the purity of cocaine hydrochloride, the more prompt and decided is the response to Maclagan's test, which moreover insures the absence of the poisonous isotropyl-cocaine. They furthermore maintain that cocaine hydrochloride, which does not respond to Maclagan's test, must be regarded as being impure and unfit for medicinal use. These results and observations are in perfect accord with those of prominent analysts, such as Drs. Paul and Cownley, as well as with those other cocaine manufacturers, such as E. Merck and C. F. Böhringer & Sons, who, though partly by other methods, have arrived at the same conclusions. — Pharm. Ztg., Aug. 19, 1899, 583.

Cocaine Hydrochloride—Schaefer's Chromic Acid Test.—In the course of a reply to criticisms on his chromic acid test for determining the purity of cocaine, by A. J. Cownley, P. H. Squire and E. Merck (see Proceedings, 1899, 758–740), Dr. George E. Schaefer insists on its superiority over Maclagan's ammonia test. He says that in applying the test it is important that the temperature of the cocaine solution be maintained at 15° C., the chromates of both pure cocaine and the amorphous alkaloids being influenced by rise and fall of temperature, heat increasing and cold diminishing their solubility. The test produces no turbidity when the acid is added to a solution of a pure specimen of cocaine, the temperature being 15° C. If, however, the solution be subjected to a considerably lower temperature, it becomes turbid, and if it be preserved at this reduced temperature for several hours, a crystalline deposit will be found, consisting of long, needle-shaped crystals of cocaine chromate. A solution of impure cocaine rendered turbid by the reagent at 15° C., and exposed to a lower temperature remains turbid for several hours, then slowly deposits a yellowish-brown amorphous sediment. These reactions are characteristic and serve to distinguish between cocaine and the amorphous alkaloids, especially isatropyl-cocaine. If a stronger acid is used the alkaloids will

separate out quicker. In order to show the superiority of the chromate test over Maclagan's test, the author prepared a series of specimens of cocaine of different degrees of purity. These, as well as the various brands of cocaine in the market, he subjected to Maclagan's and the chromate test. As a result, he found specimens which gave negative results with Maclagan's test to be impure by the chromate test, and those specimens which reacted with Maclagan's test yielded a decided turbidity upon the addition of even less than 5 Cc. of the 10 per cent. hydrochloric acid.—Amer. Drugg., July 10, 1899, 4.

On the other hand, Mr. A. J. Cownley, in a note to the foregoing, maintains that for commercial purposes Maclagan's test is to be preferred to the chromic acid test for ascertaining the purity of cocaine hydrochloride, and that this opinion is corroborated by Dr. Schaefer's own statement that specimens of cocaine hydrochloride, which were condemned by Maclagan's test, were shown to be impure by the chromate test. As has been previously stated by Mr. Cownley, the results mentioned by Dr. Schaefer only go to show that probably the only salt that would pass the chromic acid test would be one prepared from synthetic cocaine.—Pharm. Journ., July 22, 1899, 66.

Nux Vomica Alkaloids—Assay of Preparations.—F. M. Alcock gives the details of a process for the assay of the nux vomica alkaloids as applied to the extract, liquid extract and tincture of the B. P., which he considers worthy of trial and believes to possess advantages over the processes usually followed. The process recommended is best exemplified by the following application to the liquid extract: Five Cc. of the liquid extract are acidified with 5 Cc. of diluted sulphuric acid, and the mixture is shaken out with two successive portions of 20 and 10 Cc. of ether. The ethereal solution in the recorded experiment yielded a residue weighing 0.065 Gm., *but contained no alkaloid.* The aqueous solution is made alkaline (with ammonia) and shaken out with 20 Cc. of chloroform in two equal portions. In the recorded experiment 0.140 Gm. of total alkaloid was obtained on evaporating the chloroformic solution, one-half of which was shown to be strychnine. For the details in the treatment of the extract and tincture, reference must be had to the original paper, in Pharm. Journ., Feb. 24, 1900, 174–175.

Strychnine Salts — Solubility in Chloroform. — In the course of experiments made on the topic of strychnine hydrochloride and potassium arsenate (see *Solution of Sodium Arsenate*, under "Pharmacy"), J. Rutherford Hill made the observation that chloroform was not alone capable of dissolving some of the strychnine from the official (B. P.) solution of strychnine hydrochloride, but that the quantity dissolved was increased very materially by the amount of free hydrochloric acid added to the mixture. Thus four fluid drachms of chloroform dissolved from the same volume of a 1 per cent. neutral solution of strychnine hydrochloride

0.38 grain of the hydrochloride; when acidified with 10 minims of dilute hydrochloric acid, 0.71 grains; with 3 drams of the acid, 1.48 grain, indicating solubilities respectively of 1 part of strychnine hydrochloride in 868, 460 and 220 parts of chloroform. Then, again, when an excess of strychnine hydrochloride was frequently shaken directly with chloroform at 15° C. for several hours, the quantity of hydrochloride dissolved amounted to 1 part in 169 of chloroform. In each case, the residue of evaporation was neutral, and evidently consisted of strychnine hydrochloride. On the other hand, if the experiments were repeated with strychnine sulphate, the chloroform will dissolve only a quantity of the alkaloidal salt amounting to 1 in 1055 from a solution of the neutral salt, from a solution of the acid sulphate of strychine a quantity quite insignificant, and when there is a distinct excess of sulphuric acid present practically nothing at all is dissolved. When dry strychnine sulphate was left in contact with chloroform, the quantity dissolved amounted to 1 in 2846. The portion dissolved was neutral, and gave a distinct reaction for sulphate; the remaining salt was very strongly acid. Obviously, these observations have a significant bearing on the methods of standardizing the preparation of nux vomica.—Pharm. Journ., Feb. 24, 1900, 185.

Strychnine Salts—Formation of Very Soluble Double Salts with Sodium Salicylate.—Some recent observations made by A. Conrady on the solvent action of sodium salicylate on the alkaloidal constituents of *Strychnos nux vomica*, have induced him to extend his investigations to the effect of the salicylate on the salts of strychnine, the sparing solubility of which in water is well known. He found that when 1.0 of strychnine nitrate—which requires 90 parts of water for solution—is placed into a beaker with 8.0 of water, and 2.0 sodium salicylate is then gradually added under gentle heating, a permanent solution is formed, which will keep for months without changing to a brown color, and may be diluted with water to any desirable extent. When evaporated to dryness an amorphous double salt of strychnine nitrate and sodium salicylate is obtained. This double salt bears some analogy to the compounds produced with caffeine and theobromine respectively, and sodium salicylate, sodium benzoate and sodium cinnamylate, with the difference that the latter compounds unite directly with caffeine or theobromine, whereas in the case of strychnine compounds are formed with its salts and sodium salicylate. Experiments are in progress to determine in how far these observations may be utilized for the extraction of nux vomica, and to study its relation to brucine, as well as to analogies with possible compounds of benzoate and cinnamylate of sodium. So far soluble double compounds of sodium salicylate with strychnine salicylate and strychnine hydrochloride have been obtained.—Apoth. Ztg., Aug. 19, 1899, 492.

Strychnine Hydrochloride.—Reaction with sodium arsenate, see *Solution of Sodium Arsenate*, under "Pharmacy."

Anhalonium Bases.—Yields, characters and physiological action, see *Anhalonium Lewinii*, under "Materia Medica."

Japaconitine—Characters and Derivatives.—In a fifteenth contribution to our knowledge of the aconite alkaloids, by Wyndham R. Dunstan, in this instance with Harold M. Read as his co-worker, the results of investigation of the alkaloids of Japanese aconite are given. These lead the authors to the conclusion that Wright and Luff (see Proceedings, 1879, 511) were correct in regarding japaconitine as different from aconitine, but they do not agree with them as to the composition and properties of the alkaloid and its derivatives. According to the present investigators, they find that the composition of japaconitine must for the present be given provisionally. It contains four methoxyl groups, one acetyl group and one benzoyl group, and its formula may be temporarily looked upon as: $C_{29}H_{21}(OCH_3)_4(CH_3CO)(C_6H_5CO)NO_5$. It crystallizes in colorless needles, melting at 204.5° C., is almost insoluble in water and light petroleum, and soluble in acetone, chloroform, ether and alcohol. Like aconitine, japaconitine is dextro-rotatory, but its specific rotation is higher. The salts of japaconitine, on the other hand, are lævo-rotatory, the following having been examined: the hydrochloride (m. p. 149°–150° C.), hydrobromide (m. p. 172°–173° C.), hydriodide (m. p. 207°-208° C.), nitrate (m. p. 194° C.) and the aurichloride (m. p. 231° C.). By acids and alkalies, japaconitine is hydrolyzed, yielding acetic acid and a new crystalline alkaloid, to which the name

Japbenzaconitine, $C_{32}H_{47}NO_{10}$, has been given. This alkaloid occurs in rectangular plates, melting at 182°–183° C., and is about twice as lævo-rotatory as aconitine. All the salts examined crystallize readily, and include: the hydrochloride (m. p. 253° C.) hydrobromide (m. p. 205° C.) · aurichloride (m. p. 228° C.); and a colorless aurichloride derivative (m. p. 178° C.). Japbenzaconitine is itself capable of being hydrolyzed by alkalies or acids, with the production of benzoic acid and the alkaloid

Japaconine, according to the equation: $C_{32}H_{47}NO_{10} + H_2O = C_{25}H_{43}NO_9 + C_6H_5.COOH$. Japaconine cannot be crystallized, and its salts do not crystallize easily. The hydrobromide has a melting point of 221° C.

On heating japaconitine it melts, decomposing into acetic acid and a new crystalline base

Pyrojapaconitine, $C_{32}H_{45}NO_9$. This alkaloid is lævo-rotatory, as are also the following salts: the hydrochloride—crystalline (m. p. 175°–176° C.); hydrobromide—in two forms (m. p. 208 and 241° C); and the aurichloride (m. p. 161° C.). When this alkaloid is hydrolyzed by acids or alkaloids it, in its turn, yields benzoic acid and

Pyrojapaconine $C_{25}H_{41}NO_8$. This alkaloid, as well as its salts are recrystallizable.

Japanese aconite root contains a larger percentage of japaconitine than

that of aconitine in English aconite root. It also contains a small quantity of japbenzaconine, but this quantity is less than that of benzaconine in the English root.

In the course of the discussion following the reading of this paper, Mr. Dunstan remarked that the plant yielding the Japanese aconite root was recognized by botanists to be distinct from *Aconitum napellus*, yielding the English monk's-hood, namely, *Aconitum Fischeri* or *A. chinense*. The two kinds of aconitine, however, have the same physiological action.—Pharm. Journ., Nov. 25, 1899, 512; from Proc. Chem. Soc., Nov. 16, 1899.

Eserine (Physostigmine)—Preservation of its Solutions.—Dr. O. Hallauer has comprehensively investigated the causes of the reducing of eserine solutions, and concludes from his results that a preparation that will not undergo this change has not yet been produced. This decomposition may be produced by the influence of light alone, in which event the blue-rays are the most active, by ammonia, or by a temperature above 80° C., the degree of its resistance to the influence of these agents being indicative of its greater or less purity. The author has found two preservative agents which have proven serviceable in preventing or retarding the decomposition of physostigmine solutions, viz., sulphurous acid and boric acid in form of a 4 per cent. solution. Of the two, sulphurous acid is the most effective, since it prevents the changes produced by either the influence of light, of ammonia, or of temperature above 80° C., while boric acid, although it will preserve the alkaloidal solution from change for about three months, is ineffective in the presence of light, or of high temperature. The addition of either of these preservatives does not affect the activity of physostigmine solutions. The salicylate possesses greater stability than the sulphate of physostigmine, and its solution when treated with 1 to 2 drops of sulphurous acid to 30.0 Gm., is remarkably resistant to decomposition.—Apoth. Ztg., Oct. 18, 1899, 623; from Therap. Monatsh., 1899, 561.

Eserine Salts—Prevention of Color in Solutions.—O. Hallauer finds that although eserine salts which have become colored are quite as active myotics as those which are colorless, yet secondary results are produced by them, which render their use undesirable. He finds that there are no perfectly stable preparations of eserine on the market, the decomposition being caused by the blue rays of the spectrum. The stability of the specimens may be tested by adding ammonia and heating the solution to a temperature of over 80° C. Development of the color may be prevented, either by the use of sulphurous acid or of a 4 per cent. solution of boric acid; these additions do not affect the physiological action of the alkaloid. The salicylate is a more stable salt than the sulphate.—Pharm. Journ., Nov. 25, 1899, 493; from Ztschr. f. Augenheilk., through Therap. Monatsh., *13*, 551.

Solanaceous Bases—Review of Characters as Developed by Recent Inves-

tigations.—Dr. O. Hesse supplements his account of the results of previous investigations of the solanaceous bases by a review, which defines their characters as developed to the date of his present paper. In a previous paper he had recorded the observation that

Atropine has a feeble optical activity, which was in accord with the experience of Ladenburg, Schmidt and others. Having observed that atropine sulphate has a rather strong action upon polarized light, a similar behavior might be assumed in the case of other neutral salts of atropine, for instance, the hydrobromide. He was, therefore, surprised, in examining the roots of *Scopola atropoides*, at obtaining atropine which, in the state of well crystallized hydrobromide, polarized very slightly, and after two recrystallizations from absolute alcohol became perfectly inactive. From this and further observations, which are given in some detail, the author concludes,

1. That absolutely pure atropine is optically inactive.

2. That commercial atropine in a free state, if originally capable of slight polarization, may become, when long kept, optically inactive, and in any case suffers diminution of rotatory power.

3. That the optical activity of commercial atropine is due to the presence of some hyoscyamine.

4. That commercial atropine sulphate does not suffer alteration of its rotatory power when kept.

5. That owing to the presence of hyoscyamine in the gold salt of atropine, this base is more or less converted back again into hyoscyamine when the salt is kept.

It is evident from the author's results that even the atropine sulphate of the Ph. Germ. is not absolutely inactive, but contains more or less hyoscyamine corresponding to its power of rotation. As regards

Hyoscyamine, Dr. Hesse observes that the sulphate when kept for several years does not suffer any adulteration in rotatory power, but the free base does show alteration after two years, amounting to nearly 2°. The rotatory power of pure hyoscyamine sulphate with $p = 4$ and $t = 15°$ was found to be $-28°2$; with $p = 2$ it was 28°6, and from these data the amount of hyoscyamine sulphate in a sample of atropine can be calculated. In one sample noted it was 3.8 per cent.; in another 38.3 per cent.

Hyoscine has, in a former investigation by Dr. Hesse, been shown to have the formula $C_{12}H_{21}NO_4$ and not that of $C_{17}H_{23}NO_3$, assigned to it by its discoverer, Ladenburg, and he has since shown that the base is amorphous and not the same as the crystalline scopolamine of E. Schmidt, which is said to constitute the chief part of the commercial hyoscine. He finds that hyoscine exists, together with hyoscyamine and small quantities of atropine, in henbane, as well as in *Datura alba*, particularly the flowers of the latter. It also exists in the roots of *Scopola atropoides*, together with considerable proportions of hyoscyamine, some atropine, and

Atroscine, so named by Dr. Hesse, who first obtained it from commer-

cial "scopolamine hydrobromide," and then from the roots of *Scopola atropoides*, from which the latter is prepared. His investigation of the "ordinary scopolamine hydrobromide," and also of the "hyoscine hydrobromide obtained from *Scopola*," which are in fact one and the same thing, showed that this salt is really a mixture of true hyoscine salt with the hydrobromide of the base to which he has given the name atroscine, and that to the presence of the latter salt was attributable the difference in optical behavior shown by scopolamine hydrobromide (or hyoscine hydrobromide from *Scopola*) compared with that of true hyoscine hydrobromide. The amount of atroscine hydrobromide in the commercial scopolamine hydrobromide was found in one instance to be 15 per cent., in other instances from 44.8 to 83.7 per cent. The first sample had probably been obtained chiefly from *Hyoscyamus*, the hydrobromide from that material being, as was formerly the custom, mixed with that obtained from *Scopola*. The other samples were undoubtedly derived from *Scopola*, and one of them was described as "hyoscine hydrobromide." From the details given in the present paper concerning the sources, preparation and characters of atroscine, it follows that this base, in a pure condition, is identical with the

Scopolamine of E. Schmidt, which in its turn is identical with the *isoscopolamine* of the latter, this body constituting under the different names mentioned the crystals obtainable from commercial scopolamine hydrobromide, or from the hyoscine hydrobromide from *Scopola*. The designation "scopolamine" given to it by Schmidt, would therefore appear to be the most appropriate. But Schmidt, in his first investigation of the subject, confused this base with the hyoscine of Merck and Ladenburg, and since then the confusion of two different things has continued, extending even to the German Pharmacopœia Commission.* While, therefore, under the name scopolamine two entirely different bases have been understood, the designation atroscine is applicable to only one, and on that account Dr. Hesse recommends the adoption of this name. That name closely resembles the one chosen by Ladenburg for the isomeric base obtainable from hyoscyamine, and both of those names correspond to that pair of bases—hyoscyamine-atropine—as shown below:

$$\underset{C_{17}H_{23}NO_3}{\text{Hyoscyamine}} \rightleftharpoons \underset{C_8H_{15}NO}{\text{Atropine}} \rightleftharpoons \underset{C_8H_{15}NO}{\text{Tropine}} + \underset{C_9H_8O_2}{\text{Atropic Acid.}}$$

$$\underset{C_{17}H_{21}NO_4}{\text{Hyoscine}} \rightleftharpoons \underset{C_8H_{13}NO_2}{\text{Atroscine}} \rightleftharpoons \underset{C_8H_{13}NO_2}{\text{Oscine}} + \underset{C_9H_8O_2}{\text{Atropic Acid.}}$$

Just as atropine differs from hyoscyamine in its action upon the eye, so does atroscine differ from hyoscine, and thus the better action of scopolamine, as compared with hyoscine, is explicable as being due to the atroscine it contains.—Pharm. Journ., Feb. 10, 1900, 116–119.

* Scopolamine Hydrobromide is now official in the German Pharmacopœia.

Alkaloids of Belladonna, Stramonium and Hyoscyamus—Method of Assay and Percentage.—In order to obtain reliable data concerning the percentages of alkaloid in belladonna, stramonium and hyoscyamus leaves from different sources, and in different stages of development, and with the object of securing reliable figures upon which to base pharmacopœial requirements, Prof. E. Schmidt communicates a process of assay which he advises analysts who may take interest in the subject to follow. This process, which is a modification of Keller's method, yields exact and concordant results without the necessity of removing the chlorophyll and other components that usually interfere with alkaloidal assay, and it is so simple that it can be carried out even by the less experienced operator. For the exact details, reference must be had to the original paper, but the process may be briefly outlined here as follows: Taking 10 Gm. of the finely powdered drug, dried to constant weight over fresh-burnt lime, this is shaken frequently and vigorously during three hours with a mixture of 90 Gm. of ether, 30 Gm. of chloroform and 10 Cc. of 10 per cent. soda solution. Under certain precautions, 60 Gm. of the ethereal solution is filtered off, distilled to about one-half, and then shaken out with 10 Cc. of $\frac{N}{100}$ hydrochloric acid and several consecutive portions of 10 Cc. of water. The united washings and acid liquid (which are colorless) are brought to 100 Cc. with water, covered with a layer of ether about 1 Cm. in depth, and, using 5 drops of iodeosin solution (1 : 500 alcohol) as indicator, titrated with $\frac{N}{100}$ potassium hydrate until the watery layer assumes a pale red color, under specific directions given. In the final calculation, 1 Cc. of the $\frac{N}{100}$ hydrochloric acid consumed by the alkaloid corresponds to 0.00289 Gm. of atropine or hyoscyamine. Operating by this method, Prof. Schmidt obtained the following average results:

Belladonna leaves—wild—0.40 per cent. alkaloid Belladonna leaves—cultivated—0.26 per cent. alkaloid Stramonium leaves—cultivated—0.40 per cent. alkaloid	Calculated as atropine.

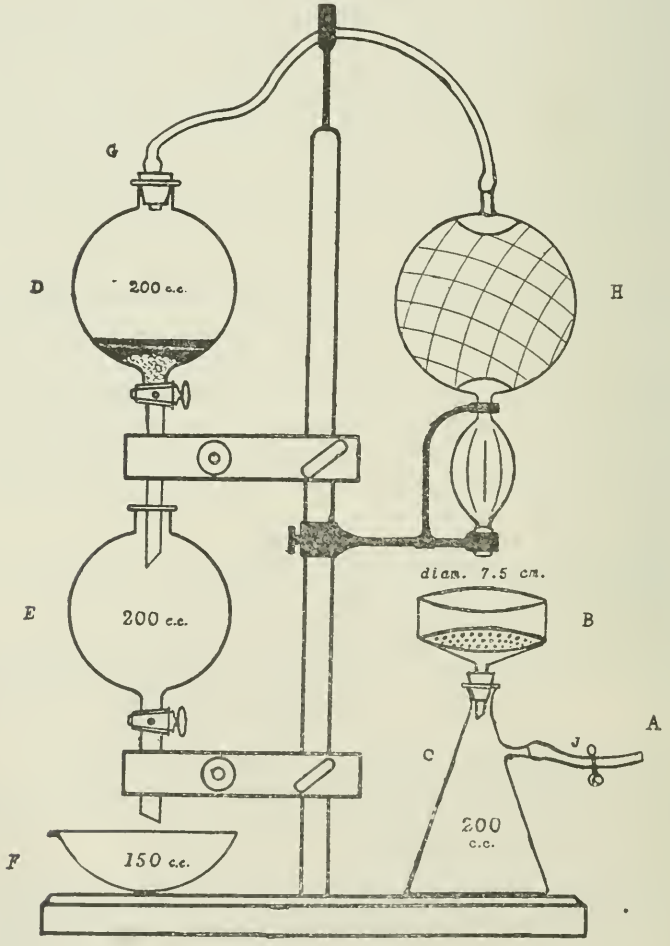
Hyoscyamus—Leaves without stems,	I. 0.2762 per cent. alkaloid	Calculated as hyoscyamine.
" " "	II. 0.2861 per cent. alkaloid	
Stems,	I. 0.363 per cent. alkaloid	
"	II. 0.365 per cent. alkaloid	

The alkaloidal content of hyoscyamus leaves and stems is a very high one in comparison with that found by others. The figures obtained with stramonium leaves are the average of a large number of determinations.—Apoth. Ztg., Jan. 6, 1900, 13–14.

Ipecacuanha Alkaloids—Improvement of B. P. (1898) Process of Assay of the Root and its Preparations.—F. C. J. Bird communicates a lengthy paper in which he gives the details of numerous experiments made to determine, primarily, the reliability of the B. P. (1898) process for assaying the official preparations of ipecacuanha, or the modifications necessary to

make it so, and, incidentally, a process for the assay of the root, which is not given officially. The two most forcible objections urged against the official process for the standardization of the liquid extract have been its tediousness and inaccuracy, the latter due to loss of alkaloid and the impure condition of the residue finally weighed. Perhaps the tediousness which has generally accompanied the working of the official process appeals most strongly to the busy pharmacist. This has been entirely overcome in the author's method of assay, aided by the use of the apparatus shown by Fig. 81, the details of manipulation being quite in accordance

FIG. 81.



with a close interpretation of the B. P. directions. Working with the official quantities, the average time occupied in the actual analysis, ex-

clusive of the drying of the residue, is about an hour, and this can be shortened by employing only one-half (= 10 Cc.) or one-fourth (= 5 Cc.) of the official quantity of liquid extract; an incidental advantage being that the special apparatus required need then only be half the figured capacity throughout. The application of the apparatus is explained by the details of the process, which is as follows:

Liquid extract of ipeccacuannha, 20 Cc.; distilled water, 20 Cc.; acetic acid, sufficient to faint acid reaction. Evaporate off the alcohol, add distilled water, 20 Cc., and liq. plumbi subacet., 10 Cc. Keep the mixture on the water bath a few minutes, until the magma produced changes to a thin liquid, and the precipitate assumes a fine granular condition. Then transfer to the filter *B* — a Buchner's funnel bearing a 7.5 Cm. paper filter on the flat perforated plate of the same diameter — and connect the flask *C* with a water pump at *A*. Wash the nearly dry solid cake finally remaining on the filter with distilled water, 30 Cc. added in small portions. To the filtrate in *C* add acid. sulph. dil., 25 Cc., replace the filter on *B* by one of very close filter paper, transfer the funnel *B* to another flask—constructed like *C*—and pour upon it the liquid in *C*, aiding filtration by a vacuum as before (a partial vacuum, sufficient for the purpose, can also be produced by suction with the mouth, and then closing the clip *J*). Wash the cake of lead sulphate with distilled water, 15 Cc. To the filtrate in the same flask, add chloroform, 5 Cc., and ammonia, an excess; cork the flask, agitate vigorously, and transfer the contents to *D*. This is an ordinary separator bearing in the neck, above the tap, a plug of cotton moistened with chloroform, and covered with a thin layer of powdered purified asbestos, and this with a thin layer of purified sand—both saturated with chloroform. Connect *D* with the pressure bulb *H* by the rubber stopper *G*, and having inflated the pressure bulb *H*, force the chloroform and a portion of the aqueous liquid in *D* through the filtering medium shown, into *E*. Should the chloroformic solution not come through quite bright, the addition of a little more asbestos saturated with chloroform will overcome the difficulty. Draw the perfectly bright chloroformic layer from *E* into the tared capsule *F*, return the aqueous liquids in *E* and *D* to the filter-flask, add chloroform, 25 Cc., and proceed as before. Repeat a third time with chloroform, 25 Cc. Finally, having collected the three chloroformic layers in *F*, evaporate, and dry the residue to constant weight at 80° C. The filter in *D*, once prepared, will serve for a number of assays of the same drug, it being necessary only to clean it by careful rinsing off any deposit without disturbing the compact layer of sand, and then forcing a few Cc. of dilute ammonia through, until the liquid passes colorless.

In the course of his experiments the author has inquired into other conditions that may affect the accuracy of the method, such as the presence of alcohol in the original liquid, the loss of alkaloid during the assay pro-

cess as well as on keeping the preparations, the presence of impurities in the final product of the assay, and the difference in the results by the gravimetric and volumetric methods of final estimation, and he has inquired also into the applicability of his method to the assay of the wine and the vinegar of ipecauanha. He concludes that the B. P. method, when carried out in the manner described by him, is both easy and expeditious. Its one disadvantage is the loss of alkaloid. This amounts on an average to about 0.08 per cent. of alkaloidal residue in the lead precipitate, while the loss by titration amounts to (an additional?—Rep.) 0.05 per cent. The presence of alcohol in a sufficiently diluted condition does not diminish the yield of alkaloids; on the contrary, it appears to facilitate the extraction.

The author also proposes a process for the assay of the ipecacuanha root, the details of which must be consulted in the original paper. The points aimed at in this process have been: (1) rapidity, and (2) the isolation of the alkaloids in such a pure condition that the gravimetric and volumetric results should be almost identical. Its chief features are extraction in the cold by an application of the well known maceration-pressure process so successfully employed in the exhaustion of drugs on the large scale; the use of a special solvent (amyl alcohol, 1 vol.; chloroform, 1 vol.; ether, 3 vols.) for the alkaloids (liberated in the finely powdered drug by sodium carbonate); the avoidance of contact of the liberated alkaloid with caustic alkali; and the purification of the final alkaloidal solution in chloroform by means of brine; the author's apparatus before described being employed in carrying out this process.—Pharm. Journ., Feb. 24, Mar. 31 and April 21, 1900, pp. 175–178, 334–335, and 414–416.

Pilocarpine and Salts—Assay and Characterization.—H. A. D. Jowett contributes a valuable paper on the assay of jaborandi preparations and the characters of some of the salts of pilocarpine. The total alkaloids of jaborandi may be extracted by one of the several methods that have been proposed by others; the amorphous, varnish-like mixture of bases is then dissolved in a saturated alcoholic solution of pilocarpine nitrate and to this solution is added a strong alcoholic solution of nitric acid—freshly prepared—to faint acidity; a small crystal of pilocarpine nitrate is then added, and the solution is allowed to stand for two hours without concentration, stirred vigorously, and any crystals which have separated are filtered off, drained by the filter-pump, washed with a saturated solution of pilocarpine nitrate, dried and weighed. From the total weight of crystalline nitrate thus obtained, the percentage of bases in the total alkaloid yielding crystalline nitrate can be calculated, it being sufficient in most cases to assume this to be pilocarpine, but if a very accurate determination be required the melting point and specific rotation of the nitrate should be determined. The melting point is usually 170° C., and should not be below 167° C.; if so, the product should be recrystallized. The author has prepared pilocarpine nitrate from two varieties of jaborandi leaves, viz., the true jaborandi

and the small-leaved Maranham jaborandi, and has purified two samples of pilocarpine nitrate purchased from manufacturers—the purification being easily accomplished by repeated recrystallization from strong alcohol. He found the pilocarpine nitrate from the different sources to be identical in all respects. The physical constants of pure

Pilocarpine Nitrate were found to be as follows: Melting point, 178° C.; rotation, $(a)_D + 82.9°$; solubility in water at 20°, 1 in 6.4. These figures agree very closely with those found by Petit and Polonowsky. In accordance with his observations, the author suggests the following pharmacopœial characterization of this salt: White distinct crystals, permanent in the air, soluble in six to seven parts of water at ordinary temperatures, and in 146 parts of cold 95 per cent. alcohol, and fairly soluble in boiling alcohol; almost insoluble in ether or chloroform. When heated in a capillary tube the salt melts at 176° to 178° C. The specific rotatory power in aqueous solution should be + 81° to + 83°.

Pilocarpine Hydrochloride forms white crystals, deliquescent in air, is soluble in less than its own weight of water, and in ten parts of absolute alcohol, but almost insoluble in ether or chloroform. When dried at 100° C. and heated in a capillary tube, it melts at 200° to 204°. The specific rotatory power in aqueous solution should be + 90° to + 92°.—Trans. Brit. Pharm. Conf., 1899, 435–441.

Pilocarpine and Other Jaborandi Bases—Review of Characteristics.—On account of the doubt expressed by Kundren, Merck, and others, as to the reliability of the work of Hardy and Calmels on the subject of the jaborandi alkaloids, as well as the recent conflicting statements of Petit and Polonowski and of Merck, H. A. D. Jowett has undertaken a complete study of these alkaloids, and has communicated his results in detail, in so far as they refer to the characterization of *pilocarpine*, *isopilocarpine* (the *pilocarpidine* of Petit and Polonowsky), *pilocarpidine* and *jaborine*, in a paper read before the Chemical Society, March 1, 1900. A resumé of his results, as given in "Chem. News" (March 16, 1900, 128), may find place here for convenient reference, as follows:

1. The original papers of Hardy and Calmels are very unsatisfactory, as they contain neither physical constants, nor analyses of the products described. In most cases the author is unable to confirm their results. On the other hand, a satisfactory explanation is afforded of the apparent contradiction between the work of Petit and Polonowsky and that of Merck.

2. The physical constants and description of the salts of pilocarpine, as given by Petit and Polonowski, are generally confirmed, though in several cases there are slight differences, due probably to the use of purer material by the author.

3. The acid character of pilocarpine has been investigated and the previous work of Hardy and Calmels on this subject corrected.

4. The existence of a base, isomeric with pilocarpine, and produced from it by the action of heat or alkali, as previously stated by Petit and Polonowski, is confirmed. As this base is isomeric with and bears a close relation to pilocarpine, it is proposed to call it isopilocarpine, as the term pilocarpidine, previously used for it, must be retained for the product previously described by Harnack under this name. It is shown that isopilocarpine can be distilled unchanged in a vacuum.

5. Some of the physical constants of isopilocarpine and its salts as given by Petit and Polonowski are confirmed, and others corrected.

6. Proof is given of the existence of isopilocarpine in jaborandi leaves, and in the pilocarpïne nitrate of commerce.

7. The existence of the pilocarpine of Harnack and Merck, and their statements regarding its composition, are confirmed. Some of the salts of the base are described.

8. The absence of pilocarpidine in the pilocarpine nitrate of commerce, and in the varieties of jaborandi leaves at present in the market, is proved.

9. The jaborine of commerce is shown to be a mixture of isopilocarpine, pilocarpidine, and a trace of pilocarpine with coloring matter. No evidence has been obtained of the existence of an alkaloid with the properties of jaborine, or of any other than those described in the paper.

10. Several experiments on the constitution of pilocarpine have been repeated, and the results of Hardy and Calmels corrected.

Caffeine — Potassium Ferrocyanide a Sensitive Reagent. — A. Archetti finds that a solution of potassium ferrocyanide heated with one-half its volume of nitric acid, and then diluted with water yields with caffeine a precipitate of Prussian blue, the reaction being so sensitive as to admit of the estimation of caffeine quantitatively.—Apoth. Ztg., Feb. 14, 1900, 110; from Bull. chimico farmaceutico.

Caffeine—Dangers in its Medicinal Use.—According to Zenetz the medicinal use of caffeine is accompanied by more or less danger. He finds that it is very slowly eliminated from the system by the kidneys, and that its action on the heart is cumulative; it is, therefore, absolutely contra-indicated in all renal diseases, in arterio-sclerosis, and all cardiac affections secondary to them. Another danger of caffeine is that the experimentally fixed toxic dose varies enormously with the individual.—Pharm. Journ., Mar. 31, 1900; from B. M. J. Epit., 1, 1900, 35.

Salamander Alkaloids—Crystallization.—Dr. Edm. S. Faust has succeeded in preparing two alkaloids from the salamander, obtaining both in the condition of pure sulphates. He finds of them,

Samandarine Sulphate was obtained generally in the form of small anhydrous needles, arranged in stellate groups or tufts, but occasionally also in fine needles, up to 1.5 Cm. long, and containing water of crystallization.

The latter effloresces on exposure to the air. The sulphate has the elementary composition corresponding to the formula $(C_{26}H_{40}N_2O)_2 - H_2SO_4$; the platino-chloride has the composition $(C_{26}H_{40}N_2O)_2.PtCl_4$. The specific rotation of the sulphate is —53.69°. When boiled with concentrated hydrochloric acid the solution first becomes violet colored, then changes to deep blue. The second of these alkaloids,

Samandaridine was obtained in the form of a difficultly soluble sulphate, having the composition $(C_{20}H_{31}NO_2)_2 \cdot H_2SO_4$. It crystallizes in rhombic lamellæ and plates, is sparingly soluble in water and in alcohol, and is optically inactive. With boiling hydrochloric acid the same color reactions are produced as in the case of samandarine sulphate. By dry distillation with zinc dust it yields an alkaline distillate, which when suitably purified forms a double salt with platinum chloride which, melting at 261° C. and containing 27.36 per cent. Pt is identified as *isocholine*. This observation is interesting, since it has heretofore been assumed that the formation of choline derivatives is confined to the vegetable organisms, whereas it is now demonstrated that poisonous alkaloids belonging to the choline derivatives are also formed in the animal organism.—Apoth. Ztg., Sept. 23, 1899, 567; from Arch. f. exp. Path. u. Pharmakol., xliii., 84.

Ricinine—Preparation and Characters.—T. Evans has advantageously modified Tuson's method of extracting ricinine from the seeds of *Ricinus communis*, using toluene for extracting the aqueous extract instead of alcohol. Upon cooling the toluene solution suddenly, the ricinine deposits on the sides and bottom of the container in form of small, almost colorless prismatic crystals, which are then completely purified by recrystallization from alcohol. It thus forms small plates, frequently united to form rosettes, having a melting point of 193° C., and the composition $C_{12}H_{13}N_3O_{31}$, which agrees well with Schulze's figures. The bromine derivative,

Ricinine Dibromide, was obtained in long colorless crystals, melting at 230°–232° C., of about equal solubility (in 200 parts) in 93 per cent. alcohol and in water. When crystallized from concentrated solutions, it is obtained in short, silky, white needles. It is soluble in hot hydrochloric acid, either dilute or concentra ed, and separates again unchanged on cooling. The aqueous solution appears to be neutral. By oxidation of an alkaline solution of ricinine with potassium permanganate, an acid product is obtained, which contains nitrogen and gives the reddish purple characteristic of ricinine, though in an inferior degree, when it is evaporated with nitric acid and then moistened with ammonia.—Journ. Am. Chem. Soc., *22*, 39.

Nicotine—Color Reaction to Distinguish from Coniine.—J. Schindelmeiser finds that nicotine, belonging to the few alkaloids for which no color reaction has hitherto been known and therefore distinguished from coniine with difficulty, will give an intense rose-red reaction if a drop of 30

per cent. formaldehyde, which must be free from formic acid, is added to the unresinified alkaloid, followed by a drop of concentrated nitric acid. The reaction is improved if the nicotine and formaldehyde are allowed to remain in contact for several hours before adding the nitric acid. In the presence of much nicotine a dark-red color is developed, while resinified nicotine produces a blood-red color. The reaction results with as little as 0.0005 Gm. of the alkaloid, and it is recommended to use as small a quantity of formaldehyde as possible. Concentrated formic acid may be used in place of formaldehyde. Neither piperidine, pyridine, trimethylamine, picoline, quinoline or aniline produces this reaction under the conditions given.—Pharm. Centralh., Nov. 16, 1899, 703.

Nicotine—Retention in Pipes.—E. Landfried has devised a cartridge which is filled with salts of molybdic acid and introduced into pipes for the retention of the nicotine when smoking. The other basic bodies, which constitute the aroma of the smoke, are, it is claimed, not affected.—Apoth. Ztg., Oct. 21, 1899, 629; from Chem. Ind., 1899, 427.

Cheiranthus Alkaloids — Distinct Physiological Characters, &c.—According to Reeb, the paralysis of the nervous system, which is occasioned by cheiranthus extract, is due to the presence of a second alkaloid, obtained by him in a crystalline condition, and named

Cheirinine; the alkaloid cheiranthine acting solely on the heart. Cheirinine is extracted by ether from neutral or faintly alkaline solutions. It crystallizes from water in small colorless needles, insoluble in cold water and in petroleum ether, but soluble in warm water, alcohol, ether, acetic ether, and chloroform. It melts at 73°–74° C., forming a transparent colorless mass, and has a composition which corresponds with the formula $C_{15}H_{28}N_2O_{17}$. Its aqueous solution is neutral, but gives precipitates with most alkaloidal reagents. The presence of *choline* has also been established in cheiranthus seeds.—Pharm. Journ., June 15, 1900, 639; from Chem. Ztg. Rep., *23*, 293.

Choline and Neurine—Physiological Action.—F. W. Mott and W. D. Halliburton have studied the physiological action of choline and neurine. The authors find that when the cerebro-spinal fluid, removed from cases of general paralysis of the insane, is injected into the circulation of anæsthetized dogs, cats, rabbits, etc., a fall of arterial blood-pressure results, with little or no effect on the respiration. Among the proteids present in this pathological fluid, which is richer than the normal fluid, is nucleo-proteid; but the fall of blood-pressure is not due to proteid, but to choline, which has been identified by chemical means. Choline, together with nucleo-proteid, doubtless originates from the disintegration of the brain tissue; but while it is an indication that an acute disintegration of the cerebral tissues has occurred, its presence in the pathological fluids will not explain all the symptoms of general paralysis.

Neurine, an alkaloid closely allied to choline, is not present in the pathological cerebro-spinal fluid. Its toxic action is much more powerful, and its effects differ from those of choline.—Pharm. Journ., July 1, 1899, 1; from Proc. Roy. Soc., *65*, 91.

Amines — Alkalimetric Distinctions.— A Astruc points out that the amines of the fatty series, such as methylamine, ethylamine, and propylamine, react monobasically both with phenolphthalein and with helianthin, while the primary aromatic amines such as aniline, the toluidines, and the naphthyl-amines, are neutral towards phenolphthalein, but are monobasic to methyl-orange. These facts agree with the thermo-chemical results, the fatty amines acting as powerful bases, while in those of the aromatic series the basicity is diminished. This diminution is produced by the substitution of an atom of H in the NH_3 molecule by a hydroxyl group. On the other hand, the substitution of two fatty radicles for two of ammoniacal hydrogen, as in dimethyl-aniline, does not affect the basicity. When the ammoniacal nitrogen forms part of the aromatic nucleus, as in pyridine and quinoline, the basicity is lessened. Helianthin therefore serves to indicate a marked acid action with a corresponding weak basicity, while phenolphthalein on the contrary will indicate a weak acidity with a strong basic reaction.—Pharm. Journ., Feb. 3, 1900, 91; from Comp. rend., *129*, 1021.

Trimethylene—Similarity and Distinction from Propylene.—Berthelot observes that trimethylene and propylene are an example of two gaseous isomers at ordinary temperatures. These substances are similar with regard to their condensation and chemical reactions, but the heat of formation and heat given out during combination differ considerably. The author has studied—(1) The reaction of bromine on the two isomers; (2) the action of zinc chloride on normal propyl alcohol and on trimethylene; (3) the action of sulphuric acid on the propylic alcohols, (4) the comparative reactions of zinc on the two isomeric bromides; and (5) the action of a temperature approaching 500° C. on propylene and trimethylene. He finds generally that trimethylene is less stable than propylene, and is transformed into its isomer, not only by heat, but even (more or less partially) by the influence of reagents employed for the formation of the bromide. These results, for which the thermo-chemical numbers are given, were predicted.—Chem. News, Oct. 13, 1899, 183; from Compt. rend., *129* (Sept. 25, 1899), No. 13.

Ptomaines—A Base giving the Reaction of Aconitine.—Dr. Merck has extracted by ether from the alkaline solution obtained from a human cadaver a base which produced the following reactions: Phosphomolybdic acid, a yellow precipitate; phosphotungstic acid, a white precipitate; potassium iodide, a brown precipitate; tannic acid, no reaction; potassio-mercuric iodide, faint turbidity; conc. sulphuric acid, a yellowish color, changing to

rose-violet on standing, and red-violet on heating; dil. sulphuric acid, colorless, becoming violet on evaporation; phosphoric acid, like sulphuric acid; conc. sulphuric acid and bromine water, no reaction; conc. sulphuric acid and nitric acid, a yellowish color; conc. sulphuric acid and potassium dichromate, no change; evaporation with nitric acid, a yellow residue, becoming orange on addition of solution of potassium hydrate; Froehde's reagent, a greenish color, becoming brown-yellow on heating. From these reactions, particularly those with sulphuric and phosphoric acid, one might conclude the base to be "aconitine." Experiments made with true aconitine obtained from different sources give a violet color with phosphoric acid and with conc. and dil. sulphuric acids under the conditions above given. These reactions cannot, therefore, be regarded as being exclusively characteristic of aconitine.—Pharm. Centralh., July 6, 1899, 413.

Phenylhydrazine—Compound with Sodium Bisulphite.—Pastureau has noticed that a solution of sodium bisulphite gave, when treated with phenylhydrazine, a crystalline precipitate very soluble in water. This precipitate was washed several times with ether, then dried on a porous porcelain plate; it occurs in the form of colorless flakes. By a second crystallization in water, slowly and carefully evaporated at 50°–60° C., the substance was obtained in the form of colorless needles radiating from a centre. Analysis gives the formula, $SO_2.Na.2(N_2H_3.C_6H_5)$; it is therefore a double sulphite of sodium and phenylhydrazine.—Chem. News, Oct. 13, 1899, 183; from Journ. de Pharm. (6), ix., No. 12.

Antipyrine—Action of Iodine.—In a former paper, J. Bougault had described a method for the estimation of antipyrine by iodine. He now communicates the results of experiments made to determine the applicability of the method to related compounds and to inquire into the processes of the reaction. He finds that the method can be used for the estimation of hypnol and salipyrine, exactly in the same way as for antipyrine; it suffices to remember that 1 Gm. of hypnol corresponds to an absorption of 0.7185 Gm. of iodine, and 1 Gm. of salipyrine to 0.7791 Gm. of iodine. It cannot, however, be used for all the compounds of antipyrine. The compound of antipyrine formed during the reaction is monoiodantipyrine, which again forms very complex compounds with the mercuric salts. When we act molecule for molecule with iodine on antipyrine, in the presence of mercuric sublimate in alcoholic solution, it appears that the antipyrine first fixes the iodine, forming an unstable product of addition, which then loses 1 molecule of HI, giving monoiodantipyrine; thus this HI would decompose a corresponding quantity of $HgCl_2$, giving HgI_2 and HCl. When the mercury addition product $(C_{11}H_{11}IN_2O)_4HgI_2HgCl_2 2HCl$, is treated with a solution of potassium iodide made alkaline with sodium carbonate, the substance is dissociated, the HgI_2, $HgCl_2$, and HCl passing into solution, and insoluble

Iodantipyrine, $C_{11}H_{11}IN_2O$, is formed in a pure condition. The solubility of this compound is only 0.080 Gm. in 100 Cc. of water. It can also be prepared by the action of iodine on antipyrine in aqueous solution in the presence of sodium acetate; the return is nearly theoretical.—Chem. News, April 27, 1900, 203; from Journ. de Pharm. (6) xi. No. 3.

Acetanilid—History, Preparation, Properties, &c.—Charles W. Gorr contributes a comprehensive paper on acetanilid in which he brings in review the synonyms under which this body is known in literature, its history, the methods of its formation and of its preparation—including patents—its physical properties, &c. Two methods for its preparation in quantities of from 30 to 120 grams are given in sufficient detail to enable the less experienced operator to work by them—the one being that of W. A. Noyes, the other that of B. Fischer. The author's paper is also provided with a profuse bibliography, which tends to add greatly to its value for general reference by students interested in the study of this important antipyretic.—Pharm. Review, July, 1899, 295–305.

Luteol—Properties and Advantages over Other Indicators.—Paul Gloess reviews the indicators in common use and compares their usefulness with that of luteol, recently proposed by Dr. Autenrieth as an indicator possessing special advantages. This is a derivative of phenacetin, obtained by the aid of phosphorus pentachloride, and is chemically

Chloroxydiphenylquinoxaline.—It crystallizes from alcohol in fine, pale yellow needles, melting at 246° C., and subliming at a higher temperature without decomposition. It is insoluble in water, difficultly in cold alcohol, easily in warm alcohol and in ether; completely insoluble in the mineral acids, but easily soluble in solutions of ammonia and the alkaline hydrates and carbonates, giving salts with a pronounced yellow coloring power. An excess of acid completely decolorizes these solutions, precipitating the luteol in the form of a whitish flocculent deposit—this reaction being very sensitive. Among the many advantages of this new indicator, the author mentions the following: It can be used for titrations of ammonia — for example, in the important determinations in Kjeldahl's process — and in the hot estimation of the alkaline carbonates. Furthermore, its great sensitiveness and its sharp change of color without causing intermediate coloration, often difficult to distinguish, make it a more desirable indicator than those commonly employed. The indicator is prepared by dissolving 1 Gm. of luteol in 500 Cc. of alcohol, five drops sufficient for a titration. It must be kept hermetically sealed, away from fumes of ammonia. — Chem. News, April 6, 1900, 165; from Monit. Scientif. (4) xiv, March, 1900.

Arginine—Distinction between the Base of Vegetable from that of Animal Origin.—Arginine, $C_6H_{14}N_4O_2$, which was first obtained by Schulze and

Steiger in the cotyledons of lupine sprouts, and subsequently recognized by Hedin in the products of decomposition of the horn substance as well as of albuminoids in general, has been the subject of renewed investigation by W. Gulewitsch, who finds that the arginine from vegetable substance is not identical with that of animal origin. The author designates the first by the name

Phytoarginine, that of animal origin as

Zooarginine. The two substances are isomeric, but phytoarginine has thrice the power of deflecting the ray of polarized light and its hydrochloride is anhydrous, whereas the hydrochloride of zooarginine crystallizes with 1 mol. H_2O. Similar distinctive characters are found in other compounds and in substitution products of the two bases.—Apoth. Ztg., July 8, 1899, 410; from Ztschr. Physiol. Chem., 1899, *27*, 178.

Congo-Red—Cause of Color-Change by Acids.—It is well known that when an excess of a mineral acid is added to an aqueous solution of congo-red, the coloring matter is precipitated in the form of blue flocks which are insoluble in water. S. Schimansky, however, finds that if these flocks are collected on a filter and washed continuously with water, the filtrate eventually begins to exert a solvent effect; it assumes a faint rose color, and the deep black-blue precipitate in the filter gradually a brown-red color. On continuing the washing it then dissolves in the water with a brown-red color, and eventually becomes very easily soluble in cold water. These observations point out that the blue derivative of Congo-red is not, as regarded by G. Schultz, the liberated acid of this azo-coloring matter, but that it is an addition product of the acid coloring matter with the mineral acid, from which the latter is easily split off with water. The free acid of Congo-red is red-brown and soluble in water.—Apoth. Ztg., Jan. 31, 1900, 72; from Chem. Rep., 1900, 15.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Synthetic Glucosides—Formation and Properties.—By the reaction between acetochloroglucose and solutions of phenols in alcoholic potash, H. Ryan has obtained a number of new glucosides belonging to the β series. Thus, from β-naphthol he obtained

β-p-Naphthol-glucoside, $C_6H_{12}O_5.OC_{10}H_7$., which crystallizes in long needles, melting at 184° to 186° C., easily soluble in alcohol and in hot water, with difficulty soluble in acetone, and scarcely soluble in benzene, ligroin, ether, or cold water. The new compound is readily hydrolyzed either by dilute acids or emulsions, reduces Fehling's Solution only after hydrolysis, and is stable towards dilute alkalies in which it is insoluble. It has a disagreeable taste. From cresol two glucosides are obtained,

β-p-Cresol-glucoside (m. p. 175° to 177° C.) and

β-o-Cresol-glucoside (m. p. 163° to 165° C.), having the composition

$C_6H_{10}O_5\,OC_6H_4CH_3$, and resembling each other as well as naphthol-glucolside. They crystallize from water in needles, and are fairly soluble in alcohol and in water, but scarcely soluble in ether, benzene, or ligroin. They possess a bitter taste, are readily hydrolyzed, and do not reduce Fehling's Solution before hydrolysis.

β-Carvacrol-glucoside, melting at 135° C., was also obtained. It crystallizes from water in needles, which are easily soluble in alcohol and in acetone, not readily soluble in ether or cold water, and scarcely soluble in benzene, chloroform, or ligroin. It does not reduce Fehling's Solution, but is readily hydrolyzed by dilute acids or emulsin, and slowly dissolved by dilute alkali.

d-Pentacetyl-glucose, melting at 110° C., is obtained by the action of acetyl chloride on dry glucose in an open vessel. The author has also prepared

Acetochloro-galactose by the action of acetyl chloride on galactose in a sealed tube. It was obtained in form of a colorless, semi-solid mass. From this

β Naphthol-galactoside was prepared by methods similar to the beforementioned.—Pharm. Journ., Nov. 18, 1899, 469; from Proc. Chem. Soc., *15*, 196.

Digitoxin—Not the Sole Active Constituent of Digitalis.—Joseph H. England, briefly reviewing the conflicting statements and results concerning the active constituents of digitalis leaves, calls attention particularly to the claim of Kiliani that *digitoxin* is the only important constituent of these leaves. Without denying that digitoxin may be the most distinctive chemical substance in digitalis leaf, it is very clear, from recently reported experiments of Dr. Karl Hofmann, as well as the pharmacological results previously reported by the author himself, that the entire therapeutical activity of the leaf cannot be due to digitoxin. Dr. Hofmann reports results had with the use of digitoxin in fifty-nine cases, principally subcutaneously or by enemata, and confirms previous investigation in referring to its insolubility in water and the vigorous local irritation caused by its use. The most remarkable fact, however, was the length of time reported as having elapsed before physiological effect was manifested. After the first dose, six hours were required to increase pulse force and lessen dyspnœa, while twelve hours were required to produce diuresis. With enemata these changes required twenty-four to thirty-six hours. It is therefore clearly impossible to believe that a drug or preparation that yields physiological effects in about thirty to sixty minutes has for its most important constituent a proximate principle, whose physiological effects are not manifested in from six to thirty-six hours. It seems more probable that, as pointed out by Prof. Boehm, the efficacy of digitalis depends not alone on the digitoxin present, but rather on the sum of its total constituents.

On the other hand, the physiological effects and importance of digitoxin must not be under-estimated. The severe local pain following hypodermic injections of this substance, the prolonged sensitiveness of injected tissues and the slowness of effects indicate a great difficulty of absorption and assimilation, so much so that the author is led to ask the question: "Is it not probable that the water-insoluble digitoxin is absorbed not as digitoxin, but as water soluble decomposition product or products?" This leads the author to the suggestion, based upon previous experiments and upon more recent ones with *Tincture of Fat-free Digitalis* (which see under "Pharmacy"), that the cumulative action of digitalis, where existent, is due to the slow absorption and elimination of digitoxin. A large number of doses of digitalis tincture having been given, and the use of the drug withdrawn, may not the accumulated digitoxin (of the tincture) by absorption give rise to the dangerous symptoms which are called the cumulative effects of digitalis?—Amer. Jour. Pharm., Aug. 1899, 279–283.

Glycyrrhizin—Determination in Extract of Licorice.—B. Hafner, believing the present methods for the estimation of glycyrrhizin in licorice extracts to be faulty, on account of incomplete extraction, impurity of the separated glycyrrhizin, and loss during the process of washing, proposes the following method as yielding uniformly reliable results: 10 Gm. of coarsely powdered extract are placed in a dry Erlenmeyer flask with about 200 Cc. of 95 per cent. alcohol, 25 Cc. of normal sulphuric acid is added, and the mixture occasionally shaken during several hours, conveniently and more expeditiously with application of gentle heat. The mixture is filtered and the filter washed until the washings pass colorless; the filtrate and washings are diluted with 100 Cc. of water, ammonia is added to faint alkalinity, the alcohol evaporated completely, and the liquid adjusted with water to 100 Cc. if necessary and cleared, in case of turbidity, by the addition of a little ammonia. It is now again filtered, diluted sulphuric acid is added with constant stirring to complete precipitation, the precipitated glycyrrhizin is collected on a filter, and washed with very dilute sulphuric acid (2 to 3 per cent.) until the washings pass colorless. The filter and contents are then dried as well as possible in a vacuum over sulphuric acid at the ordinary temperature, then transferred to a beaker, and extracted on a water-bath with repeated portions of acetone until the acetone solution passes colorless. The united actone solutions of glycyrrhizin are then evaporated in a high beaker with addition of excess of precipitated barium carbonate until all the acetone is dissipated, the residue is mixed with 200 Cc. of hot water, gradually added, the clear solution of barium glycyrrhizate is decanted into a 500 Cc. flask, and the residue washed with successive portions of hot water until 500 Cc. of solution is obtained. After cooling, and subsidence of any barium carbonate, mechanically carried over by decantation, 100 Cc. of the clear—if necessary filtered—solution are evaporated to dryness, dried to constant

weight. The weight so ascertained, multiplied by the factor 0.8153 gives the amount of glycyrrhizin, or multiplied by 0.8308, the ammonium glycyrrhizate in 2 grams of the extract. To control the experiment, a weighed quantity of the barium glycyrrhizate is treated with an excess of concentrated sulphuric acid in a platinum crucible, dried and heated to redness. The weight of barium sulphate, so obtained, multiplied by the factor 0.5882 gives the absolute amount of barium present in the sample, and this represents 18.76 per cent. of chemically pure barium glycyrrhizate.—Ztschr. Oest. Ap. Ver., 1899, 542.

In continuation of the foregoing, the author records the results of experiments made to determine the nature of the precipitate produced by sulphuric acid, and whether by extraction with alcoholic sulphuric acid the maximum quantity of glycyrrhizin, as compared with the methods heretofore in use, is attainable if the error occasioned by loss in washing the glycyrrhizin is eliminated. Concerning the first question, his present results show that glycyrrhizin (or glycyrrhizic acid) in aqueous solution does not enter into chemical combination at all, the precipitation from such solution being explained by the fact that, while glycyrrhizin is soluble in pure distilled water, it is insoluble in water acidified with sulphuric acid. In order to arrive at a definite conclusion with regard to the second question, the author extracted Martucci licorice with water, with alcohol of different strengths, with 95 per cent. alcohol and sulphuric acid and with 10 per cent. ammonia solution, and determined the glycyrrhizin in the different liquids so obtained. The aqueous extraction gave the lowest, the alcohol-sulphuric acid the highest yield of glycyrrhizin. The purification of the crude glycyrrhizin is absolutely necessary, the purest product being obtained with the alcohol-sulphuric acid extraction, coupled with the acetone method of purification. The degree of purity of glycyrrhizin appears, however, also to depend upon the character of the material from which the licorice extract is prepared, as well as the process of its preparation. Ammoniacal water, for instance, produces an extract from which a larger yield of crude glycyrrhizin is obtained than from extract prepared with water alone, but at a sacrifice of purity. It appears, therefore, that the use of ammoniacal water for the extraction of the roots, as directed in the U. S. Pharmacopœia, is not justified from a chemical point of view.—Ztschr. Oest. Apoth. Ver., 1900, 241.

Saligenin—Compound with Tannic Acid.—L. Sell & Co. have patented a compound of saligenin and physiological tannic acid, which is obtained by the interaction of the two bodies at an elevated temperature in presence of diluted acid. The new body is a brownish solid, and has a faint aromatic odor. It is insoluble in water, sparingly soluble in benzene, ether, petroleum benzin, petroleum ether, and diluted acids, partly soluble in acetone, but easily soluble in alcohol, methyl alcohol, and acetic acid of 50 per cent., being precipitated unchanged from such solutions by water.

It is also easily soluble in alkalies, and precipitated from such unchanged on addition of acids.—Apoth Ztg., Sept. 2, 1899, 524; from Chem. Ztg., 1899, 708.

Homonataloin—A Constituent of Natal Aloes. — In continuation of his researches on the aloins (see Proceedings, 1899, 757), A. Leger finds that besides nataloin, Natal aloes contains homonataloin, which differs from the former in having a CH_2 group less. It was obtained by fractional crystallization from boiling methylic alcohol solution of the crude aloins remaining after treating Natal aloes with acetone to exhaustion, the homonataloin separating from the boiling methylic alcohol in crystalline crusts, while the more soluble nataloin separates afterwards in crystalline pale yellow scales. Both aloins are anhydrous. To nataloin the author attributes the formula $C_{16}H_{18}O_7$, and to homonataloin $C_{15}H_{16}O_7$. The following reactions, which are common to both these aloins, distinguish them from barbaloin: A solution of the aloins in sulphuric acid gives with manganese dioxide or potassium dichromate a bright green color. A fragment of ammonium persulphate added to a solution of the aloin in caustic soda slowly develops violet color, which dyes silk, but is not fixed by cotton. — Pharm. Journ., July 15, 1899, 45; from Compt. rend., *128*, 1401.

Cathartic Drugs Containing Oxymethylanthraquinones—Chemistry.— In former investigations Prof. Tschirsch has shown that aloes, frangula, senna and rhubarb contain emodin, and split off this body, while Oesterle has shown that, although the emodins obtained from the different drugs are not identical, they are isomeric and have the composition $C_{15}H_{10}O_5$. Physiological experiments made by Kronecker and others point out that the action of these drugs is intensified by the presence of alkalies, and Prof. Tschirsch therefore proposes an examination of these in a new direction. The drugs are to be percolated with ammonia, the percolate is to be precipitated with hydrochloric acid, and the precipitate, containing the original glucosides of the drug as well as their products of hydrolysis (rhein, emodin, chrysophanic acid) are to be used for further chemical and clinical experiment—these precipitates being designated, according to their source, as *anthraglycosennin*, *anthraglycorhamnin*, *anthraglycorhein*, *anthraglycosagradin*, etc. In the course of the examination of these anthraglyco substances from *Senna* and *Rhamnus cathartica*, made in conjunction with Hiepe and Polacco, a new series of bodies was determined, for which Prof. Tschirch proposes the general name of

Nigrins, on account of their color and similarity to alonigrin. These bodies remain after the treatment of the anthraglyco substance with water, acetone, alcohol, ether and toluene, as insoluble residues, but are soluble in alkalies and are split up with formation of oxymethylanthroquinone when heated with alcoholic potash solution. Alonigrin also yields this product. The author regards these nigrins to be intermediate products, having a certain relation to cathartic acid.—Apoth. Ztg., Sept. 27, 1899, 572.

Glucosides of Frangula, Cascara and Rhubarb — Method of Separation into Groups.—Dr. E. Aweng, in continuation of his previous investigation of the glucosides of frangula and cascara barks and of rhubarb root, has devised a method whereby he has succeeded in separating the glucosides contained in these drugs into narrow groups. For this purpose the finely powdered drugs are successively extracted—(1) with benzene; (2) with a mixture of 2 parts of benzene and 1 part of absolute alcohol; and (3) with 60 per cent. alcohol in a Soxhlet apparatus; the extraction being continued in each case until the solvent passes colorless. In this way he obtained with anhydrous benzene from *frangula bark:* emodin frangulin and chrysophanic acid; from *cascara bark:* emodin and chrysophanic acid, while frangulin has not been determined and its presence remains an open question; from *rhubarb root:* emodin and much chrysophanic acid. By means of petroleum ether these two bodies are readily separated, only chrysophanic acid being dissolved by it. With the benzene-alcohol mixture he obtained from *frangula bark* a sparingly soluble glucoside, which hydrolyzes with dil. hydrochloric acid to form frangula-rhamnetin, some free frangula-rhamnetin, and the body formerly designated by him as "pseudo frangulin," but which is very probably a calcium compound of frangulin; from *cascara bark:* almost exclusively the glucoside yielding frangula-rhamnetin, and very little "pseudo frangulin;" from *rhubarb root:* three glucosides, yielding respectively emodin, chrysophanic acid, and a body closely related to, if not identical with frangula-rhamnetin. With 60 per cent. alcohol the author separated from the drugs mentioned the bodies which he has in his previous investigations designated as "primary glucosides," those separated by benzene and by benzene-alcohol representing his so-called "secondary glucosides." From *frangula bark* he obtained besides a little frangula-rhamnetin, emodin, and "iron emodin," mainly frangula-rhamnin: from *cascara bark*, a glucoside, soluble in baryta water, which corresponds to frangula-rhamnin in every respect, but only traces of emodin and "iron-emodin;" from *rhubarb root*, a glucoside which possesses characters identical with frangula-rhamnetin and glucosides yielding, by hydrolysis, emodin chrysophanic acid, some frangula-rhamnetin, and a little "iron-emodin." The various roots of rhubarb root examined, Rhapontic as well as Chinese, gave essentially the same results, with the difference only in the proportions, and it seems probable that the same holds true for different samples of frangula and cascara bark. All the fractions obtained by the different solvents were found active, though in a greater or less degree; of the products of hydrolysis, however, only emodin and chrysophanic acid possessed activity. The designations: frangula-rhamnin, frangula-rhamnetin, pseudo-frangulin and "iron-emodin," are employed by the author provisionally for their commercial identification.—Apoth. Ztg., Dec. 13, 1899, 747–748.

Plumeride—Characters.—Franchimont has investigated the bitter prin-

ciple of *Plumeria lancifolia*, which has heretofore been obtained from the same source by Boorsma and by E. Merck. He finds the principle obtained by the two authors named to be identical, the differences observed in regard to their melting point—that obtained by Merck melting at 138° C., while Boorsma's product did not melt at all—being due to their differing in water of crystallization. Franchimont finds that plumeride crystallizes well, is optically active $[\alpha]_D = -106.7$, the melting point after crystallization from water being 153° C. By treatment with acetic ether free from water it is obtained completely anhydrous. By heating with 5 per cent. hydrochloric acid an amorphous brown mass separates, and the solution contains dextrose. By continued treatment with 10 per cent. solution of sodium hydroxide and acidification, a crystalline acid separates, which is quite insoluble in hot water and in methyl alcohol. This body is evidently also a glucoside, closely resembling agoniadin. It deviates the plane of polarized light more powerfully than plumeride, is devoid of bitter taste, and when boiled with diluted hydrochloric acid, splits off dextrose.—Chem. Ztg. Rep., *23*, 334.

Curangin—A Glucoside from Curanga Amara, Juss.—Dr. S. E. Boorsma has investigated the properties of curangin, an uncrystallizable bitter principle from curanga, a herbaceous scrophulariacea of Dutch and British India, previously isolated by Dr. W. G. Boorsma. It is best obtained by extracting the herb with acetic ether, dissolving the residue after distillation in alcohol, treating the solution with alcoholic lead acetate, removing the excess of lead with H_2S, and evaporating the filtrate to dryness. The residue of evaporation is extracted by boiling with a mixture of 1 vol. of alcohol and 4 vol. of chloroform, the solution decolorized with animal charcoal, and the glucoside precipitated by the addition of ether. It is finally purified by repeated solution in alcohol and precipitation with ether, which completely removes the peculiar odor of the glucoside and deprives it of a faint acid reaction. From 1100 Gm. of the dry herb, 23 Gm. of purified curangin were so obtained. Curangin is readily soluble in alcohol, methyl alcohol, acetone containing water, and in acetic ether. Chloroform dissolves it only partially; but the two portions into which it may be by this means divided are remarkable in that, except their solubility, they possess identical behavior to reagents, in their melting points, and in their elementary composition, which corresponds to the formula $C_{15}H_{22}O_{10}$. It is partially soluble also in anhydrous acetic ether and anhydrous acetone, in amyl alcohol and in benzene, but very sparingly soluble in ether, petroleum ether, carbon disulphide or water. Its solutions are neutral, and do not yield the glucoside in a crystalline condition. Its glucosidal character was determined by well-known reactions.—Apoth. Ztg., Oct. 21, 1899, 628; Nederl. Tijdschr. v. Ph. Ch. en Tox., October 1899.

In a second paper Dr. S. E. Boorsma communicates the results of fur-

ther investigations concerning the glucosoidal characters of curangin. W. G. Boorsma has succeeded in splitting off a yellow, amorphous, tasteless body by boiling its alcoholic solution, containing 8 per cent. of hydrochloric acid, which he named

Curangægenin.—But the new body was evidently impure and the hydrolysis incomplete. Dr. S. E. Boorsma has now succeeded in splitting up the curangin completely into sugar and curangægenin by boiling it during 15 hours with 60 per cent. alcohol, containing 2 per cent. of hydrochloric acid. The former, also, had succeeded in dividing curangægenin into two bodies, the one, composing the larger portion, amorphous and soluble in ether, the second, crystallizing in fine white needles, insoluble in ether. Dr. Boorsma has now succeeded in obtaining both bodies in a crystalline condition, the only difference between them being that of their respective solubility in ether. This leads him to conclude that the one is gradually converted into the other form of the same body.—Apoth. Ztg., Nov. 25, 1899, 711; from Nederl. Tijdschr. v. Pharm. Ch. en Tox., Nov. 1899.

Spiræin.—A new glucoside from *Spiræa Kamchatica*. See *Spiræas*, under "*Materia Medica*."

Hederin—Toxicity.—A. Joanin finds that hederin (see *Ivy* under "Materia Medica," Rep.) has remarkable toxic action on warm-blooded animals. The lethal dose to rabbits and guinea-pigs is from 5 to 7 centigrammes for each kilo of body weight by hypodermic injection, or 2 to 3 centigrammes for intravenous injections. On dogs it acts as a powerful emetic and purgative.—Pharm. Journ., Aug. 5, 1899, 139; from Compt. rend., *128*, 1467.

Cotoin—Condensation Product with Formaldehyde.—An odorless and tasteless cotoin derivative is obtained, according to "Chem. Ind." (1899, 363), as follows: 5 p. of cotoin are dissolved in 30 p. of alcohol and 20 p. of water, 1.5 p. of 35 per cent. formaldehyde and 15 p. of fuming hydrochloric acid are added, and the mixture is heated on a water bath until the precipitate formed is no longer increased. On cooling the precipitate is washed with diluted alcohol and dried. The new body forms yellow, odorless and tasteless crystals, which melt, under decomposition, at 211°–212° C. By increasing the quantity of formaldehyde to 5 parts in the above proportions, a polymeric—probably trimolecular—product is obtained.—Apoth. Ztg., Sept. 2, 1899, 524.

Capsaicin—Characters.—Karl Micko describes a new and very complicated method by which he obtained capsaicin in a pure condition from a variety of capsicum designated as "Königspaprika," though he has obtained it by the same process from ordinary Cayenne pepper. It was obtained in the form of dazzling white, glistening crystals, melting at 63°–65.5° C.; insoluble in cold water, cold dilute or concentrated hydro-

chloric acid, with difficulty soluble in these liquids when hot. It forms a colorless solution with concentrated sulphuric acid, and is acted upon violently by concentrated nitric acid, forming a brown-yellow solution. Elementary analysis leads to the formula $C_{18}H_{28}NO_3$. It contains a methyl group, and yields benzoyl capsaicin by the method of Schotten and Baumann.—Apoth. Ztg., Aug. 19, 1899, 493; from Oest. Chem. Ztg., 1899.

Vanillin—Formation in the Fruit.—It is a well-known observation that the peculiar fragrance of vanilla is not developed in the fruits until they have undergone, when gathered in the green state, a process of curing, or until they have completely ripened, or rather, have become over-ripe upon the plant. This has led to the inference that the vanillin is formed during these processes from some pre-existing, non-odorous body partaking of the nature of a glucoside, an assumption which has recently been further strengthened by the observation of J. Behrens, who has succeeded in developing the odor of vanillin in the odorless juice of fresh vanilla leaves by boiling it with dilute mineral acids. Dr. W. Busse now records some observations which appear to leave little doubt that vanilla fruits naturally contain an odorless glucoside, which by hydrolysis, induced probably by fermentive action during the curing or ripening process, is split up into vanillin. He had the opportunity to experiment with an unripe fruit of *Vanilla pompona* obtained from the Royal Botanical Garden, Berlin, and found that while this fruit when crushed emitted simply a herbaceous odor, the odor of vanillin was distinctly developed when it was suitably extracted with alcohol, etc., and the final product of extraction was hydrolyzed with diluted hydrochloric or sulphuric acid, or subjected to the action of emulsin. Indeed, he obtained a small amount of a final product, possessing the characters of crystals of vanillin, but the quantity was too small for absolute identification.—Apoth. Ztg., Jan. 27, 1900, 63.

Vanillin—Production from Potato Peels.—W. Braeutigam, having observed a decided vanilla odor in potato peels which had been placed in an oven for the purpose of drying, investigated the cause, and after various experiments, in which the odor could be developed under certain conditions and from certain kinds, while in others it failed, he became convinced that the production of vanillin actually occurred. He has succeeded in separating a substance possessing not only the odor, but also the macrocospic and microscopic characters of vanillin. He furthermore finds that the quantity of vanillin produceable from potato peels depends on a favorable conjunction of heat and atmospheric air, as also on the kind of potatoes under treatment.—Pharm. Ztg., Feb. 28, 1900, 164.

Vanillin—Sophistication.—L. F. Kebler calls attention to several sophistications of vanillin observed by him. A large lot purchased on sample of undoubted quality, proved on examination to be a mixture of six per cent.

of true vanillin and ninety-four per cent. of acetyl-iso-eugenol, the direct antecedent of synthetic vanillin. Though differing somewhat in physical appearance from genuine vanillin, those not very familiar with this may not observe a difference. Another sample of vanillin that came under the author's notice was nothing more or less than cumarin, while a third lot, which was of a flaky nature and peculiar odor, consisted to the extent of 90 per cent. of gum benzoic acid, the remainder being vanillin, with possibly a sprinkling of cumarin. Here, the high melting point, 105° C., affords a ready test, since pure vanillin melts at 79° to 83° C. It is otherwise, however, with the first-mentioned sophistication, acetyl-iso-eugenol, which melts at 78° to 79° C. Incidentally the author calls attention to a so-called "double extract of vanilla," which is asserted to be made from the fraudulent vanillin, consisting mainly of benzoic acid. This he finds to furnish a very good imitation of vanilla extract when suitably diluted, and the product might mislead even experienced parties. It seems to be supplied largely to department stores.—Proc. Penna. Pharm. Assoc., 1899, 117–118.

Cumarin—Distinction of the Synthetic Product from that Obtained from "Deer-tongue."—Schimmel & Co. state for several years two kinds of cumarin of a rather different character have been on the market, the one manufactured synthetically, the other from the leaves of *Liatris odoratissima*, Willd.—the so-called "deer tongue." They observe that an unbiased comparison of the aroma of these two preparations shows the synthetic cumarin to be decidedly preferable, since it has the pure odor of tonka bean, or of cumarin prepared from it, whilst the cumarin from "deer-tongue" is affected with a peculiar, disagreeable odor, which technical skill has as yet been unable to remove. This odor remotely suggests nitrobenzene, and is due to the presence of a foreign substance, the nature of which has not yet been determined.—Schimmel & Co.'s Semi-An. Rep., April 1900, 65.

COLORING MATTERS.

Flower Pigments—Development.—P. Q. Keegan describes a series of experiments made with the object of deciding between the view of Berzelius that the original color of anthrocyan is red, and that of Wiesner that it is blue. His conclusion is, on the whole, favorable to the former hypothesis; but he believes that there are different stages in the development of the floral pigment. In the lower stages the natural color is red, whatever the chromogen may be; while in the higher stages the natural color of anthrocyan is blue; or rather, at least with some chromogens, it becomes capable of forming blue compounds with alkalies and certain metallic acids. There also exist chromogens which, except under very exceptional conditions, are incapable of producing a blue pigment. These, in all stages, naturally develop into a red, the brilliancy of which unquestionably attests

its real origin and proper character. — Pharm. Journ., Jan. 13, 1900, 21; from "Nature," Nov. 30, 1899.

Vegetable Coloring Matters.—Kinds used as additions to *Fruit Syrups*, which see under "Pharmacy."

Indican—Occurrence in the Chlorophyll Grains of Indigo Plants.—In a former communication to the Vienna Academy, H. Molisch had given the most important results of his studies while in Java concerning the preparation of indigo. These led to the conclusion that the production of indigo is not a physiological, but a purely chemical process, in which bacteria exert very little or no influence. In the present paper the author discusses the formation of the glucoside indican in the living plant, the hydrolysis of which produces the indigo blue. If an indigo plant is exposed to the vapor of ammonia, alcohol or chloroform, the life of the cells is destroyed and the indican is converted into indigo, the distribution of the blue coloring matter in the cells being determinable exactly in the same way as is starch by the iodine reaction. In all plants—among them several new indigo plants—examined by the author, the indican was found in the chlorophyll grains, other cell-contents containing very little. The indican exists mainly in the chlorophyll of the parenchyma of the green leaves.—Apoth. Ztg., Dec. 20, 1899, 765; from Ber. d. Deutsch. bot. Ges.

Indigo—Function of the Diastatic Constituent of the Plants.—Breaudat concludes from experiments made on *Isatis sativa* that in those species of *Indigofera* and *Isatis* which yield indigo, the presence of alkaline bases or those of the alkaline earths, or their soluble or insoluble carbonates, is necessary for the formation of indigo, while the presence of acids or neutral salts is inhibitory. The oxidizing power of the soluble oxydase contained in the sap is but feeble; but this power is increased by the presence of alkalies, alkali earths, or their carbonates.—Pharm. Journ., Aug. 12, 1899, 159; from Compt. rend., *128*, 1478.

Indigo—Method of Preparation in Hupei (China).—According to a British Consular Report the following is the method of preparing indigo in Hupei, China. Indigo is sown towards the end of June and gathered about the middle of September, the plants being either pulled up by the roots or cut down with sickles and tied into small bundles. A number of wooden tubs of uniform size (3'6" high and 11'9" in circumference) with a hole in the side about 14 inches from the bottom, closed with a wooden stopper, are filled a little more than half full with clear water, and about forty or fifty bundles are immersed in each tub and soaked for twenty-four hours. As soon as white spots begin to appear on the leaves, the bundles are taken out and strained off into the tub. Stone lime is added and the whole stirred with a wooden rake until a mass of foam is produced. It is then left to stand from six to ten hours, the stopper removed, the water drawn off, and the indigo transferred to baskets in which it drains.—Pharm. Journ., June 15, 1899, 549.

Indigo—Estimation of the Blue and Red.—W. F. Koppeschaar observes that of all the methods used for the estimation of indigo, the colorimetric method is the best, but only when the material contains no other coloring matter; the presence of such giving a dirty appearance when the solution obtained by treatment with concentrated sulphuric acid, diluting, and filtering, is contrasted with the pure indigotine solution in the colorimeter. In the method of titration by permanganate, we can never be certain that the impurities have not been oxidized, at least partially, and the exact determination of the reaction is difficult to observe; while in the presence of a notable proportion of indigo red, the method is no longer available. As a consequence of new methods of production, practiced in Java as well as in India, indigo now contains more indigo red than it did formerly. Synthetical indigo red is more generally employed, but it is not identical with natural indigo red, and contains about 25 per cent. of indigotine. The carmine from synthetic indigo red is distinguished by its easy solubility in concentrated solution of sodium chloride, in which that from natural indigo is practically insoluble. The author proposes now a colorimetric method for the estimation of indigo blue and indigo red, by which the difficulties usually encountered are overcome. It depends upon the solubility of red and brown indigo in glacial acetic acid, in which blue indigo is insoluble. By this method, the details of which are given, the differences of observation are reduced to from 0.2 to 0.8 per cent. with indigo blue, and much smaller ones with indigo red.—Chem. News, Jan. 26, 1900, 37: from Ztschr. Anal. Chem., 1899, xxxviii. (1), 1.

Indigo—Relative "Fastness" of the Natural and Artificial Products.—Camille Kurz records the results of experiments made to determine the relative "fastness" of natural and synthetic indigo. Pieces of fabric dyed with artificial indigo under the same conditions as some dyed with the natural product were found as dark in color, but of a purer shade. The pieces lost less color on rubbing than did pieces dyed with natural indigo. Resistance to washing, soap and light were perfectly equal, except that natural indigo becomes a little duller on exposure to light, whilst synthetic indigo preserves its bright shade, only losing in intensity.—Chem. and Drugg., Oct. 28, 1899, 703.

In connection with the foregoing, the results of tests made upon numerous samples of cloth sold as "indigo dyed," reported by Dr. K. N. McDonald recently, are interesting, showing that there is much cloth put on the market that is not dyed with pure indigo, natural or synthetic, since none of the samples examined responded to the requisite. The

Tests for Indigo and its Adulterants in Cloth were as follows:

1. Put a piece of the cloth ½ inch square on a saucer, plate, or other porcelain dish, and drop two or three drops of strong nitric acid upon it. If pure indigo a bright yellow spot with a green rim is quickly developed.

2. Place a small piece of cloth ½ inch square on a plate or in a porce-

lain basin, and just cover it with pure sulphuric acid. The liquid becomes greenish-yellow or olive, then passes through various shades of green to a deep blue. After half an hour dilute with water, when the solution assumes a bright blue color if dyed with indigo, if with alizarine the solution becomes violet. If logwood and indigo are present together the solution becomes green or greenish-blue. There are other tests, but the above are quite sufficient for all practical purposes and can be easily applied.—Ibid.

Alizarine-Green, B.—A New Indicator.—J. Fornianeck describes *alizarine-green, B,* an acid coloring matter belonging to the group of oxazines and thiazines, which is produced by the action of β-naphthoquinonesulphonic-acid on amido-napththol-sulphonic-acid in alkaline solution at a high temperature. It forms a black-green powder, soluble with comparative ease in water, and producing a dirty-green solution. In ethyl alcohol, on the other hand, it dissolves, although more sparingly, with a flesh-red color. If a little of this solution is added to acid solutions to be titrated with alkali, the solution at first handsome red becomes flesh-red at the point of neutrality, but immediately on addition of excess this changes to green. The use of the new coloring matter is the same as that of litmus, over which it is not shown to possess any advantages.—Apoth. Ztg., April 28, 1900, 286; from Ztschr. Anal. Chem., 1900, *39*, 99.

Animal Chlorophyll—Derivation from Vegetable Food Containing Chlorophyll.—Experiments made by A. Dastre and N. Floresco to determine the source of the chlorophyll in the livers of the *Annulora*, which they found uniformly as a constituent of the liver of snails of all sorts, both during their active life, and during hibernation in the winter. They determined, however, that if all food containing chlorophyll is carefully withheld from the period of awakening from their winter's sleep, the chlorophyll was absent in the liver of apparently healthy animals, cholechrom taking its place, but reappeared as soon as they were again provided with food containing chlorophyll. It may, therefore, be concluded that the so-called animal chlorophyll is simply vegetable chlorophyll localized in a remarkable and permanent manner in the cells of the animal's liver.

A New Yellow Coloring Matter.—Occurrence in *Digitalis lutea*, which see under "Materia Medica."

Quercetin.—The coloring matter of "heather," see *Calluna vulgaris*, under "Materia Medica."

Nepodin—The True Yellow Coloring Matter of Various Species of Rumex.—While Grothe has formerly contended that the tinctorial properties of several species of *Rumex* are due to chrysophanic acid, Liebermann subsequently found that chrysophanic acid possesses no permanent tinctorial value, and expressed the opinion that the production of a handsome and permanent yellow color upon fabrics must be due to some other substance present in the rhizomes of the plants named. O. Hesse has

now made some investigations which prove that the roots of *Rumex nepalensis*, *R. palustris* and *R. obtusifolius* contain a handsome yellow coloring matter, *Nepodin*, a derivative of proto-catechuic acid, and having the composition $C_{18}H_{16}O_4$, which is a true dye capable of imparting a fast yellow color upon fabrics. A second yellow dye color,

Lapodrin, $C_{18}H_{16}O_5$, was also isolated by the author from *R. obtusifolius* along with nepodin, and proven to be a homologue of trimethylanthragallol. Like nepodin it produces a fast and handsome yellow color upon fabrics. Nepodin is contained most abundantly in *R. nepalensis* roots, which are known to be used largely in India as a yellow dye.—Pharm. Centralh., Aug. 17, 1899, 509; from Ztschr. f. angew. Chem., 1899, 703.

Gossypetin.—A glucosidal coloring matter from the flowers of *Gossypium herbaceum*, which see under "Materia Medica."

Genistein.—A new coloring matter resembling apigenin and vitexin in "dyers' weld." See *Genista tinctoria* under "Materia Medica."

Betulin—A Red Coloring Matter from the Bark of Betula Alba.—C. J. Reichardt finds that a filtered decoction of the bark of *Betula alba* yields on addition of hydrochloric acid a precipitate, which when well washed and carefully dried furnishes a red-brown powder having a leather-like odor and a bitter taste. The substance so obtained, or in the moist condition, yields with alcohol or hot glycerin concentrated solutions of a deep red color, which may be used with advantage as a substitute for rhatany red or cochineal for imparting color to cosmetics or pharmaceutical preparations, which according to the quantity added is from rose-red to deep brown-red. The tinctorial power of this coloring matter, which has been named betulin, is materially enhanced by alkalies, and reduced by acids, which precipitate it from the solutions mentioned when strongly diluted with water. It is obtainable from the bark to the amount of 20 per cent. of its weight.—Pharm. Centralh., Sept. 28, 1899, 587.

Pyrobetulin—Preparation from Birch Barks.—J. Wheeler has patented a process for preparing two betulin derivatives — pyrobetulin and pyrobetulin anhydride—direct from birch barks. The finely divided epidermis of birch bark, particularly of that from *Betula alba*, is intimately mixed with an oxidizing agent, such as potassium nitrate, compressed into tablets, and then subjected to combustion, whereupon the betulin is obtained as a sublimate. For *pyrobetulin* from 4 to 8 per cent. of nitrate is used, and the combustion must be rapid and with free admission of air, but when *pyrobetulin anhydride* is to be prepared, only from 1 to 4 per cent. of nitrate is used, the tablets are packed closely together, and the combustion is effected slower. — Apoth. Ztg., Oct. 21, 1899, 629; from Chem. Ztg., 1899, 892.

Albuminoids.

(*Including Animal Products.*)

Albuminoids — Molecular Value.—W. Vaubel has made comprehensive investigations to determine the molecular value of certain albuminoids, in order to arrive at a nearer acquaintance with the constitution of these bodies. Their molecular values were determined by five methods, depending (1) on the melting and congealing point; (2) on their compounds with metals; (3) on their sulphur content; (4) on their halogen and other substitution compounds; and (5) on their products of hydrolysis. With the aid of the one or the other of these methods, the following values were ascertained:

1. Oxyhæmoglobin = 16780, 16513, 15000.
2. Globin (from hæmaglobin) = 16086, 15870, 15000.
3. Serum-albumin = 5100, 5135, 4572.
4. Muscle-albumin (from horse flesh and beef) = 4572, 5135.
5. Conglutin and other vegetable albuminoids = 5634 (from crystalloids of the "Para nut"), 8848 (from pumpkin seed), 6200, 6690, 5050 (conglutin).
6. Egg-albumin = 4618 to 6542, varying according to the preparation.
7. Casein = 6542 and 6500.

—Pharm. Ztg., Aug. 13, 1899, 583; from Jour. f. prakt. Chem., *60*, 55–71.

Albuminoids—Influence upon the Toxicity of Alkaloids.—S. Pouchet finds that certain albuminoids contained in the juice of the fly agaric, although not themselves powerfully toxic, greatly increase the toxicity of the muscarine contained in the juice. The lethal dose of the juice deprived of these albuminoids is much larger than that of the juice in the normal state. The observed symptoms differ; the simultaneous injections of what alone would be non-toxic doses, both of the alkaloid and of the albuminoids, is speedily followed by death. The author is engaged in experiments to determine if the observed toxicity of other organic substances, such as curare, may not in part be due to the action of some such albuminoids, which alone are of comparatively low toxicity, but which aid the absorption of the toxic alkaloids.—Pharm. Journ., Aug. 5, 1899, 139; from Bull. Gen. de Therap., *137*, 901.

Egg Albumin—Crystallization Promoted by Hydrochloric Acid.—T. B. Osborne finds that the crystallization of egg albumin is promoted on adding acetic acid to the half saturated ammonium sulphate solution, as pointed out by Hopkins, because the crystallized egg albumin is a compound of the protein substance with acid. When the albumin is first mixed with the ammonium sulphate solution an alkaline reaction towards litmus can be detected, and a decided odor of ammonia develops. This evidence of free ammonia disappears after some hours, and the solution is then neutral to litmus, continuing so during the gradual separation of the

albumin. The deposited albumin, whether in form of spheroids or crystals, reacts distinctly with litmus and phenolphthalein, when filtered off and dissolved in water. By the addition of acetic acid, as directed by Hopkins, the albumin is obtained completely crystallized by a single precipitation, and without concentration by evaporation. Mr. Osborne, however, finds that a substitution of a molecularly equivalent quantity of hydrochloric acid causes the separation to take place even more quickly.—Jour. Amer. Chem. Soc., 21, 477.

Albumin—Kind Present in Strychnos Seeds.—Em. Bourquelot and J. Laurent find that the horny albumin of the seeds of *Strychnos ignatii* and of *Strychnos nux vomica* contain the same carbohydrates, mannane, and galactane, as the leguminous seeds already examined by them, but that the proportion of galactane is remarkably high; this is notably the case in nux vomica, so that crystalline galactose may be easily obtained by the hydrolysis of its albumin, the yield being greater than that obtained from lactose, the source from which this sugar has hitherto been prepared.—Pharm. Journ., June 30, 1900, 687; from Compt. rend., *130*, 1411.

Chloroglobin—A Vegetable Albuminoid Analogous to Hæmoglobin.—According to Tsvett, chlorophyll and xanthophyll exist in the living plant in a state of loose combination with an albuminoid, the compound formed being analogous to the hæmoglobins of animals; he has, therefore, named it chloroglobin. To obtain it, a saturated solution of resorcin is employed in which it is readily soloble. After removal of the resorcin by washing in water, the chloroglobin obtained is soluble in alcohol, ether, benzene, chloroform and carbon disulphide, and in strong aqueous solutions of chloral hydrate; but after treatment with certain coagulating reagents, such as mercuric chloride, tannin, formaldehyde, it ceases to dissolve in these solvents; like the albuminoids, it has a great affinity for certain coloring matters, such as fuchsine, chrysoidine and methylene blue. The solution in neutral aqueous resorcin decomposes in a few hours, throwing down a deep green granular deposit, and crystals of xanthophyll.—Pharm. Journ., Nov. 25, 1899, 493; from Compt. rend., *129*, 607.

Blood—Available Method for its Detection by Means of the Guaiac Reaction.—After briefly reviewing the propositions of the last thirty years concerning the detection of blood with guaiac resin, and with the so called "antozonides," viz., with peroxide of hydrogen or the analogous compound contained in isolated essential oil and acting like peroxide of hydrogen, Prof. Edw. Schaer communicates a method which he has determined to be reliable, short and direct. It depends upon the ready solubility of the blood, even when quite old in the form of a stain, in a strong 65 to 80 per cent. aqueous solution of chloral hydrate, and the solubility of guaiac resin, as well as guaiaconic acid, especially concerned in the formation of "guaiac blue," in the same solvent. Furthermore, it has been found that the solution of the blood constituents by aqueous chloral hydrate is much

facilitated if the blood spots have been previously wetted with small quantities of concentrated acetic acid, whereby the "guaiac blue" is not affected, whilst on the other hand it serves as a control reaction, since in the casual presence of nitrites in the stain a more or less intense blue coloration would be caused *at once*, owing to the decomposition of these salts, whereas the blood simply acts as an oxygen carrier. The reaction, therefore, under normal conditions, can take place only if some reagent is added which easily parts with oxygen, such as *Hünefeld's ozonized turpentine*, or an adequate solution of hydrogen peroxide, neither of which will produce the "guaiac blue," reaction by themselves with a guaiac solution in normal conditions.

The test may be carried out by moistening the blood stain with a little acetic acid and then extracting with a 1 per cent. solution of guaiac in an aqueous solution of chloral hydrate containing 70 to 75 per cent. of the latter. But, inasmuch as the resin constituents of the guaiac concerned in the subsequent reaction show a marked tendency to spontaneous oxidation, it is better to first extract the blood by means of chloral solution and then to add to the resultant blood solution an equal volume of guaiac-chloral solution. To this blood-guaiac solution a stratum of Hünefeld's* turpentine solution, or of an adequate solution of hydrogen peroxide is added carefully, without mixing; then an intensely blue and rapidly increasing zone appears at the point of contact of the two solutions, with extraordinary sensibility, whereas by sudden mixture of the two solutions a less pure blue coloration of the liquid results. This test as here described is thoroughly applicable to a control reaction, viz., to the chemical identification of the hemin-crystals, particularly good results being obtained if in place of guaiac-chloral solution, a solution of guaiaconic acid in 200 to 500 parts of chloral solution is employed.

While it is true that numerous other substances, such as nitrous acid, free chlorine, bromine, iodine, chromic anhydride, permanganic acid, peroxide of lead, the ferric and cupric salts, quinine, etc., also have the property of producing "guaiac blue," these one and all produce the blue color *directly*, and do not require the aid of an ozone-carrier (Hünefeld's solution, etc.). Moreover, most of these substances are *a priori* excluded in the material submitted to blood tests. — Amer Journ. Pharm., Aug., 1899, 361–370.

Modern Blood-Preparations—Classification into Groups.—The numerous modern preparations of blood, recommended for the treatment of anæmia, mal-nutrition, etc., on account of the ease with which the hæmo-

Hünefeld's reagent is obtained by exposing oil of turpentine to air and light for some time and then mixing 15 Cc. of the ozonized turpentine with 25 Cc. of alcohol, 5 Cc. of chloroform, and 1.5 Cc. of glacial acetic acid. The "ozonized turpentine" may conveniently be replaced by the same quantity of a 3 to 5 per cent. solution of hydrogen peroxide, which must be free from acids.

globin contained, or supposed to be contained, in them splits into easily assimilable albumin and hæmatin, have been the subject of investigation in the laboratory of Dr. Lewin by Dr. W. Rosenstein. He has examined them spectroscopically in order to determine the purity and character of the blood-pigment, and as a result of his investigations has been enabled to divide these various preparations into three groups, as follows:

Group I., containing the *Hæmoglobin* in an unchanged condition, or only faint traces of *Methæmoglobin*. To this belong: Pfeuffer's "Hæmoglobin," Hommel's "Hæmatogen," Goldmann's "Fortuna-Hæmatogen," and Theuer's "Hæmoglobin-Albuminate."

Group II. is characterized by containing compounds of *Methæmoglobin* and *Hæmatin*. To this belong: Pfeuffer's "Physiological Hæmoglobin-Albumin," Nardi's "Hæmoglobin," Sauer's "Dynamogen," Radlauer's "Hæmoglobin tablets," Merck's "Hæmoglobin in lamellis," and Hertel's "Ferrhæmin."

Group III, comprises products in which the normal spectroscopic blood-line can no longer be recognized. To this group belong Dahmen's Hæmalbumin," Kobert's "Hæmol," and Kobert's "Hæmogallol."

Dr. Rosenstein's conclusions are not favorable to any of these preparations. In fact the recommendation of blood-preparations of any kind is based on false premises, since the resorption of hæmatin by the stomach and intestinal tract has not been proven. — Pharm. Centralh., Jan. 25, 1900, 48.

Milk—Average Composition, etc. — J. C. Leusden reports the results of an extensive series of examination of the mixed milk of from 40 to 60 Holland cows, made twice a week during the period of one year, the mixed milk samples being taken from cows while in the pasture and while in the stable, morning and evening. The average composition of the milk for the year was found to be as follows:

Milk.	Morning.	Evening.	Daily average.
Sp. gr. of the milk	1.03124	1.03090	1.03108
Sp. gr. of the curdled milk (sour)	1.02792	1.02795	1.02794
Sp. gr. of the milk curdled spontaneously	1.02706	1.02716	1.02712
Fat, determined by centrifuging	2.85 per cent.	3.28 per cent.	3.08 per cent.
Dry residue	11.51 " "	11.93 " "	18.72 " "
Dry residue freed from fat	8.64 " "	8.65 " "	8.645 " "

The author remarks that the composition of the milk is dependent on the weather, as well as on the time of the milking. Thus, on Sundays and holidays there is an appreciable reduction in the numbers. For the purposes of control (the determination of adulteration) the milk from the

cows milked in the stable serves better than that from cows milked in the pasture.—Apoth. Ztg., Oct. 25, 1899, 635–636; from Nederl. Tijdschr. v. Phar. Chem. en Tox., Oct., 1899.

Milk—Convenient Estimation of Fat.—A. Bonnema recommends the following convenient method for estimating the fat in milk: Place 10 Cc. of the milk into a flask of 100 Cc. capacity, add 4 Cc. of potassium hydrate solution (20 : 100), shake for a moment, add 25 Cc. of ether, then shake during 5 minutes in the warm hand. The well-closed flask is now immersed for some time in cold water, 2 Gm. of tragacanth are added quickly, and the closed flask is again thoroughly shaken, the tragacanth absorbing all the water. After again cooling the flask in cold water, 10 Cc. of the ether solution are poured into a narrow tube, transferred to a tared capsule, the tube rinsed with a little ether, and the solution and rinsings are then evaporated and dried to constant weight. The weight so ascertained, multiplied by 25, gives the quantity of fat in 100 Cc. of the milk.—Apoth. Ztg., Nov. 15, 1899, 687; from Chem. Ztg., 1899, 541.

Milk—Experiments with Preservatives.—H. E. Annett records some experiments with animals on the physiological action of boric acid and formalin, which throw considerable light on the question of their use as food preservatives. Five kittens were fed on milk containing 80 grains of boric acid per gallon. In four weeks all were dead. Five kittens were fed with milk containing 40 grains per gallon; two died in the third week, and the rest in the fourth. Five control kittens received pure milk; none died. With milk containing formalin similar results were obtained. Of five kittens treated with milk containing 1 part of formaldehyde in 50,000 of milk, three died in five weeks; the average increase in weight was 177.6 Gm., compared with 251.1 Gm. of four control kittens treated with normal milk; with milk containing 1 : 25,000 of formaldehyde, another series showed an average gain of 196.6 Gm., as against 325.7 Gm. gain by kittens fed on normal milk. Of a third lot, treated with milk containing 1 part of formaldehyde in 12,500 of milk, two died in the fourth week; the average gain in weight was only 94.6 Gms. against 312.5 Gms. with the "controls" fed on normal milk.—Pharm. Journ., Dec. 9, 1899, 549; from Lancet, *2*, 1899, 1282a.

Sugar-free Milk—Preparation from Cream.—R. T. Williams recommends the following method of preparing a milk which is practically free from lactose: A pint of water is placed in a tall vessel, and two or three tablespoonfuls of fresh cream is well stirred up with it. The mixture is allowed to stand for twelve to fourteen hours, when most of the fatty matter of the cream rises to the top and may be collected. This is practically free from milk sugar. It is then mixed with water, and the white of an egg added, then more water to bring the mixture to the color and consistence of milk. A little salt or a trace of saccharin may be added, which

will produce a palatable and nutritious beverage. Lauritzen has slightly modified this, omitting the egg albumin and the saccharin. He mixes 100 Cc. of cream with three times its volume of water, allows it to stand for twelve hours, then every 50 Cc. of the separated and washed cream is diluted with 200 Cc. of cold water. He has obtained good results with this beverage in eight cases of diabetes.—Pharm. Journ., Nov. 25, 1899, 493; from Med. Chron., 2, 97.

Casein—Preparation for making *Cod Liver Oil Emulsion*, which see under "Pharmacy."

Aluminum Caseinate—Preparation and Uses.—At the meeting of the German Naturalists and Physicians (Sept. 18, 1899), Rud. Meyer called attention to a new compound, aluminum caseinate. Milk, freed from albumin by repeated heating to 62° C., and straining, and then sterilized, is precipitated with the official (G. P.) liquor alumini acetici; the precipitate is washed completely with water, and after removing the water with alcohol, deprived of fat by means of ether. The product is dried at a moderate temperature, and while drying rubbed to powder. So obtained it is a yellowish-white powder, having the sp. gr. 1.3, and containing uniformly 5 per cent. of aluminum. It is insoluble in water, but is sparingly dissolved when macerated in saliva at a temperature of 40° C. It yields aluminum to acids, even dilute. It is tasteless, and when chewed reminds of coagulated albumen. The therapeutic value of aluminum caseinate depends on the astringent action of the aluminum, and it has proved an efficient and certain remedy in cases of intestinal catarrh, in doses of 0.25 to 0.3 Gm.—Apoth. Ztg., Sept. 23, 1899, 566.

Oxidases—Occurrence in the Vine.—According to C. Cornu, the vine must be added to the list of plants containing oxidizing ferments. He finds that all the organs of every variety of the grape-vine examined by him contain the oxidase, and that the ferment is more active in the spring than in the autumn.—Pharm. Journ., Dec. 9, 1899, 549; from Jour. de Pharm. Chim. (6), 10, 342.

Oxidases and Peroxidases—Action upon the Chlorophyll of Autumnal Foliage.—The fact that chlorophyll by oxidation becomes decolorized and converted into a yellowish pigment, leads Woods to suggest that oxidizing enzymes, which are widely distributed in plants, might take part in the autumnal destruction of chlorophyll and spotting of leaves. His experiments lead to the conclusion that two groups of oxidizing enzymes—oxidases and peroxidases—are normally present in small quantities in the higher plants. Under certain conditions, not well understood, these enzymes either become more active or are produced in larger quantities, causing variegations and various "diseases;" for example, the "mosaic disease" of tobacco. If the epidermis of a leaf showing yellow spots be carefully removed, and the cells moistened with a 2 per cent. alcoholic

solution of guaiac resin, the yellowish cells become intensely blue, while the surrounding healthy cells are much less deeply colored. Portions of leaves may be ground up with sand and extracted with distilled water and fresh guaiac resin solution in absolute alcohol added. Those enzymes which give a direct reaction with guaiac resin are termed oxidases. Those which require the addition of peroxide of hydrogen are termed peroxidases. These enzymes retain their activity for a long time in the dry state. In aqueous solution the oxidases are destroyed by a temperature of 65°–70° C., acting for five minutes, the peroxidases by five minutes' exposure to 80°–85° C.—Pharm. Journ., Dec. 30, 1899, 621 ; from Central. f. Bak. 2 Abt., v., 745.

Ferment of Locust Beans — A Type of the Ferment in Seeds Containing Horny Albumin.—Extending their researches in the light already obtained by them in their investigations on the ferments of the locust bean (see also the observations of Effront, in Proceedings, 1898, 850), E. Bourquelot and H. Hérissey find that this ferment may be considered typical for all those seeds which possess a horny albumin. Among these, the seeds of fenugreek and lucerne, selected on account of the rapidity with which they germinate, are also found to secrete soluble ferments during germination, which are capable of hydrolyzing and rendering assimilable the carbohydrate reserve material of the horny albumin. The action of these ferments is comparable to that of warm dilute sulphuric acid, finally producing mannose and galactose ; while the insoluble residue which they leave is but feebly attacked by the same dilute acid.—Pharm. Journ., Feb. 3, 1900, 91 ; from Compt. rend., *130*, 42.

In continuation of the foregoing, the authors remark that they consider the ferment of leguminous seeds possessing a horny albumin to be a specific zymase, for which they suggest the name

Seminase. They find that this ferment, precipitated from aqueous extractions of the seeds of fenugreek and of lucerne, differs from malt diastase in rapidly effecting the hydrolysis of the albumin of the locust bean, which diastase attacks but slowly. On the other hand, seminase is very much less active on starch paste than diastase, and even this action is probably due in great part to the trace of diastase which these seeds contain together with the seminase. It is evident, moreover, that this small quantity of diastase plays an important part in the nutrition of the growing plant, since the cotyledons of both fenugreek and lucerne contain, during the first period of germination, considerable quantities of starch which ultimately disappears.—Pharm. Journ., March 17, 1900, 277 ; from Compt. rend., *130*, 340.

Cynarase—A Rennet-like Enzyme from Cynara Cardunculus—Rasetti has isolated the rennet-like enzyme contained in the flower heads of *Cynara cardunculus*, and studied its characters. Like rennet, its activity

is destroyed at 65° C.; its maximum activity is at 50°, while that of rennet is at 40°. The aqueous solution of this vegetable rennet, which the author has named "cynarase," is clear, yellowish, neutral, does not turn guaiac-paper blue, froths strongly when shaken, is not coagulated by heat, but is precipitated by alcohol and by basic lead acetate. It has no effect on starch paste or on cane sugar. In the dry state it may be heated for a long time to 100° C. without destroying its activity, but short heating to 130° destroys it. It contains 7.17 per cent. of nitrogen. The author observes, furthermore, that the so-called "flower cheese" or "viterbo cheese" (formaggio di fiori) is prepared with the aid of an infusion of the flower heads of this plant, commonly known as the cardone or Spanish artichoke, and considers it probable that the closely related large artichoke, *Cynara scolymus*, contains a similar ferment.—Pharm. Ztg., July 15, 1899, 494; from Jour. de Pharm., 1899, 438.

Papain—Action of Heat.—The statement of Wuertz that if papain is thoroughly dried its digestive power on fibrin is but little, if at all, influenced by prolonged exposure to a temperature of 100° C., is confirmed by the experiments of V. Harley, who finds, however, that it is quite otherwise when the ferment is in solution. A series of digestions conducted at various temperatures, in which the amount of matter dissolved, the optical rotation of the resulting solutions, and the weight of the residual undigested fibrin were determined, show that the proteolytic action of papain in solution is destroyed at about 82° C. Fibrin was found to be quite unaltered when digested in a solution of papain which had previously been heated to 82.5° C. From the color produced by tyrosinase on the products of digestion, it would appear that heat merely has the effect of lessening the digestive power of papain, but does not modify it in any other way. In all cases, even when the digestive action has been reduced to a minimum, in the solutions heated to the highest point, the typical color-reaction at first red, then green, was obtained with tyrosinase, only differing in intensity from that produced by unheated papain digestion products. —Pharm. Journ., May 12, 1900, 495; from Journ. de Pharm. [6], 11, 269.

Papain—Comparison with Pepsin.—V. Harley has made comparative experiments upon the digestive action of papain and pepsin upon fibrin, from which he concludes that the products formed are very similar, and quite distinct from the digestion-products of fibrin with pancreatin. He finds that papain is slightly more active in acid than in alkaline solution. The products of digestion in both cases give with tyrosinase at first a reddish color, then a deep green, which is more intense in the case of papain than with pepsin.—Pharm. Journ., March 31, 1900, 333; from Journ. de Pharm. [6], 10, 172.

New Animal Ferment—Occurrence in Most Internal Organs.—E. Abelous and E. Gérard find that most of the internal organs of animals con-

tain a soluble ferment, which reduces nitrates and appears to be of a diastasic nature, being most active between the temperatures of 20° to 40° C., but destroyed at 72° C. This new ferment exists in variable proportions in the different organs, being most abundant in the liver and kidneys, while striated muscular fibre and brain substance contain the least. —Pharm. Journ., Sept. 9, 1899, 235; from Compt. rend., *129*, 56.

Animal Ferments—Probable Co-existence of Oxidizing and Reducing Kinds.—The further researches of E. Abelous and E. Gérard point to the probable co-existence of an oxidizing and a reducing ferment in the tissues of the organs of animals. They find that when a maceration of horse kidney is allowed to act on a solution of potassium nitrate, that a certain amount of nitrite is formed, which after twenty-four hours in the incubator at 42° C., begins to diminish in quantity. If a trace of sodium nitrite be similarly treated, the greater part disappears: but if the kidney maceration be first boiled, no oxidation of the nitrite ensues. Similar but even more pronounced results of the same nature are obtained with the ferment precipitated from the aqueous kidney maceration by means of alcohol. Further, the reducing ferment may be almost wholly removed by submitting the renal pulp to the digestive reaction of papain or trypsin, while the oxydase becomes even more energetic than before. On the other hand, the last-named ferment may be rendered inactive by removing the air from the aqueous maceration, and exposing the experimental mixture to an atmosphere of inert gas, such as hydrogen.—Pharm. Journ., Jan. 20, 1900, 51; from Compt. rend., *129*, 1023.

Animal Ferments—Presence and Function in the Kidney of the Horse.—E. Abelous and E. Gerard find that the kidney of the horse contains both an oxydase and a reducing diastase, and that the latter has the power, in an atmosphere of hydrogen, of converting nitrobenzene into phenylamine. This action explains the formation of bases in the organs of animals, and confirms the opinion of Gautier that these bases are formed in the tissues apart from any action of putrefactive germs.—Pharm. Journ., April 7, 1900, 357; from Compt. rend., *130*, 420.

Pepsin—Conditions Determining its Solvent Power.—Jean Effront communicates the results of investigations concerning the conditions that determine the solvent power of pepsin. Pepsin exerts both a solvent and a hydrating action. The digestive action of pepsin depends upon the amount of acid content of the medium, the nature of the acid, and the degree of division of the albumen acted upon. A content of 1.5 Gm. hydrochloric or 3.0 Gm. sulphuric acid per liter presents the most favorable conditions when acting upon moist fibrin or upon an emulsion of coagulated albumen; but while the full quantity of hydrochloric acid was capable of dissolving 88 per cent. of the fibrin acted upon, the maximum quantity of sulphuric acid dissolved only 43 per cent. under the same

conditions, while, to obtain the same result with coagulated albumen if this was not employed in form of an emulsion, but in a finely chopped up condition, the maximum quantity of acid required was in the case of hydrochloric acid 3 Gm. and in that of sulphuric acid 5 Gm. per liter. A properly prepared emulsion of coagulated egg-albumen presents a white, opaque fluid, which does not become clear until the last trace of albumen is dissolved. If we determine the exact time required for the disappearance of the white color of a definite volume of this liquid, we may measure the activity of a sample of pepsin. For this purpose 10 Cc. of an egg-emulsion prepared with hydrochloric acid water of the indicated percentage and containing 0.16 Gm. of dry coagulated albumen, are mixed with an equal volume of water, heated in a test-glass of 18 Mm. diameter in a water-bath to 50° C. and mixed with 0.5 Cc. of a 0.5 per cent. pepsin solution. A pepsin, which under these conditions produces a clear solution within a period of 20 minutes is to be designated with the figure 100. The author, furthermore, observes that the most favorable temperature for the solvent action of pepsin is 65° C., a temperature, it is true, very near the limit above which its activity is destroyed. The temperature of 65° C., however, is only the most favorable in the presence of 1.5 Gm. of hydrochloric acid pro liter, falling to 55° in the presence of 3 Gm. and to 50° in the presence of 4 Gm. in the liter. The presence of chemical substances in the solution also influences the activity of pepsin unfavorably in most instances. Such are particularly the sulphates, and to a less degree, in the order named, the chlorides of the alkalies, of the alkaline earths and least of the heavy metals. $CaCl_2$, however, has an unfavorable influence equal to NaCl. Caffeine, which apparently promotes peptonization, exerts no influence upon the solvent power of pepsin. Antipyrine, in 1 per cent. solution, retards it, while sodium salicylate exerts a retarding action even in quantities of 0.0025 per cent. Fatty acids, alcohols and boric acid, on the other hand, do not affect the activity of pepsin in quantities that do not exceed 1.25 per cent.—Apoth. Ztg., March 31, 1900, 218; from Bull. Soc. Chim. (3) 21, 683–691.

Pepsin—Inadequacy of the B. P. Test.—F. H. Hoseason states that the B. P. test for pepsin is inadequate and of little value. Any trustworthy test must be based on its peptonizing, not its solvent, power, although possibly there may be a ratio existing. From experiments made, there is reason to believe that a satisfactory process may be arrived at by using syntonin as the basis. The following process is suggested tentatively: Treatment of known weights of syntonin and pepsin in acid solution for one hour at 100° F., removal of the unaltered syntonin and proteoses by zinc sulphate, precipitation of the peptone by an excess of standard bromine-water, filtration and titration of the residual bromine.—Pharm. Journ., March 31, 1900, 338.

Pepsin and Pancreatin (Trypsin)—Influence of Heat.—V. Harley has

studied the effects of heat upon pepsin and pancreatin. In the case of pepsin he finds that continuous heat weakens the digestive power, and that this is completely destroyed when its aqueous solutions are heated to 68° C., while even at 60° C. there is evident diminution of digestive power. Watery solutions, however, appear to offer greater resistance to the influence of heat than when it exists in its natural (physiological) media. The power of digestive action of trypsin (or pancreatin) in aqueous solution is destroyed at 60° C., and is distinctly affected at 55° C. The drying of these products must therefore be effected at the lowest possible temperatures. — Apoth. Ztg., March 21, 1900, 189; from Journ. de Pharm. Chim., 1899, x., 195.

Diastasic Ferment—Occurrence in the Yolk of Eggs.—Dr. Joh. Müller, having incidentally noticed that the yolk of fresh laid hens' eggs is capable of exerting considerable amylolytic action, followed up his observation by further experiments made in conjunction with Dr. Masuyama. It was found that if an emulsion of the egg-yolk with starch paste is allowed to stand from 12 to 24 hours notable quantities of both dextrin and fermentable sugar may be determined in the product. The absence of both of these from the original starch paste was proven, as was also the absence of bacteria having diastasic activity. Further investigation of the products of the amylolytic action determined that these consisted of erythrodextrin, achroodextrin and a sugar, which from its optical rotation, the melting point of its osazone and its behavior with yeast fungi must be regarded as being iso-maltose. In its general character and properties the amylolytic ferment of eggs, which is present also in the albumen, though inferior in quantity, resembles the ptyalin of the saliva. Under favorable conditions the diastasic action is quite strong. In an experiment noted, 45 per cent. of the starch employed was converted into soluble products during 24 hours, but the proportion of egg-yolk to starch is not mentioned.—Apoth. Ztg., Dec. 2, 1899, 727; from Münch. med. Wochschr., 1899, 1583.

Gasterin—A Product of the Gastric Juice of Dogs.—Le Gendre calls attention to "gasterin," a product of the gastric juice of dogs, obtained by a method suggested by Frémont. It is recommended for trial in all kinds of stomach affections with the exception of those of a carcinomatose character, and has been known to give relief, and even to effect cures, in cases for which no remedy has heretofore been known. Linossier, however, believes the salutary effects of this remedy to be simply due to hydrochloric acid and pepsin, which are present in the gastric juice of the dog in much greater quantities than in the medicaments customarily prescribed.—Apoth. Ztg., Mar. 28, 1900, 210; from Münch. Med. Wchschr., 1900, 407.

Thyroids and Other Animal Organs—Presence of Arsenic.—According to A. Gautier, arsenic is constantly present in the thyroid gland, apparently, like phosphorus and iodine, combined in the nuclein. He finds that when

thyroid glands are submitted to peptic digestion, the peptones are absolutely free from arsenic, but the residual nucleins are relatively rich in that metalloid. Arsenic is also found in minute quantities in the spleen and in the skin, but no other organ gives even the faintest trace. This precise limitation of its occurrences has important toxicological significance, since its presence, even in minute traces, in any but the organs specified, is regarded as abnormal. — Pharm. Journ., Jan. 20, 1900, 41 ; from Compt. rend., *129*, 929.

Thyroid — Bromine a Constituent of the Glands of Sheep. — Baldi has demonstrated the presence of bromine in the thyroid gland of sheep as follows : The aqueous solution of the ash of the gland, obtained by incineration with potassium nitrate and caustic soda, is evaporated to dryness, the residue treated with (solution of ? Rep.) permanganate until distinctly colored, and then heated to 100° C. On cooling, the liquid is acidulated with sulphuric acid, and transferred to a flask fitted with two tubes, one dipping below the surface of the liquid, the other, shorter, merely entering the flask and carrying a piece of test paper saturated with fluorescein. From 3 to 7 Cc. of a 16 per cent. solution of cupric sulphate is now introduced through the longer tube, and gentle aspiration started through the shorter, when, in a few minutes, the test paper becomes reddened by the formation of eosin by the action of the bromine liberated.—Pharm. Journ., Sept. 9, 1899, 235 ; from Arch. Ital. de Biol. through Repertoire (3) *11*, 308.

Animal Extracts—Preparation by Cold.—Lépinois finds it practicable to prepare animal extracts by the well-known freezing process suggested by Hervera many years ago, the advantages being that the products so obtained possess indefinite stability and are free from unpleasant odor. The animal substance, thyroids for instance, is macerated in cold chloroform water and the solution subjected in a cylindrical vessel to a freezing mixture of ammonium nitrate and chloride with water, whereby a temperature of — 10° C. is obtained. To prevent the formation of compact ice, the solution is stirred during this operation, and the small ice-crystals so produced are drained at a temperature of about — 18° ; this process of freezing and draining being repeated until the animal extract is sufficiently concentrated, the rejected ice retaining very little of the active animal substance. Operating upon 150 Gm. of thyroid gland, the author obtained 650 Cc. of filtrate, of sp. gr. 1.020, which after the first freezing was reduced to 320 Cc. of liquid extract ; this, after again freezing was reduced to 180 Cc., having a sp. gr. of 1.045, and this yielded a final dry product weighing 110 Gm. The melted ice resulting during this process yielded only 24 Gm. of extract, containing 19 Mg. of iodine per liter of liquid employed, whereas the larger quantity of extract contained 60 Mg. of iodine per liter of liquid used. The liquid resulting from the melted ice may, moreover, be employed for the next extraction, and all loss thus avoided. Similar

good results were obtained in extracting liver.—Pharm. Post, June 25, 1899, 357; from Rép. de Phar.

URINARY COMPOUNDS.

Urine—Determination of Albumen by Means of Sozoiodol.—G. Guèrin finds a 10 per cent. of solution of sozoiodol to be a very sensitive reagent for albumen in urine. If to from 8 to 10 Cc. of the filtered urine 10 to 15 drops of this reagent are added a milky turbidity or a white flocculent precipitate is formed, according to the quantity of the albuminoid present. Neither the alkali-water nor uric acid are affected by the reagent, and while the albuminoses, the peptones, and most of the alkaloids are also precipitable by sozoiodol, the precipitates are again dissolved on heating. On the other hand, the nucleo-albumins give only faint turbidity with sozoiodol, but on heating form perfectly insoluble precipitates. The reagent should not be exposed to light.—Apoth. Ztg., Dec. 2, 1899, 726; from Les nouv. Remedes.

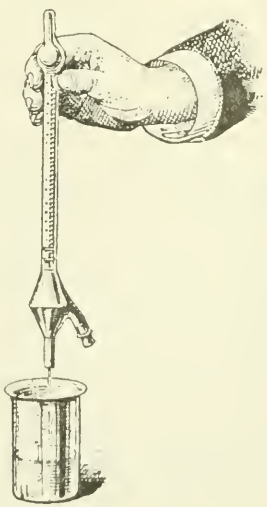
Urine—Method of Determining Mercury Present.—According to Drs. Schumacher and Jung the following method for the determination of mercury in urine is thoroughly trustworthy. It depends upon the fact that stannous chloride, when added to solutions of mercury salts, reduces them to metallic mercury, and the finely divided metallic particles thus obtained in suspension can be combined with gold to form an amalgam. The gold must be in an extremely fine state of sub-division, obtained by soaking fine asbestos fibres in a concentrated solution of gold chloride, and reducing the gold salt by heating the fibres in a current of dry hydrogen gas. The resulting "gold asbest" is cleaned with diluted hydrochloric acid, then dried and used as a filter for the liquid containing the mercury in suspension. A thick pad of asbestos is first placed in the narrowest part of the filter tube, a layer of "gold asbest" is placed next, then a layer of granular spongy gold, and, finally, a second layer of "gold asbest." The dilute mercury solution, after being heated to about 70° C., is mixed with about 50 Cc. of clear, freshly prepared stannous chloride solution. After cooling a little the mixture is aspirated through the filter amalgam tube, which is afterwards washed with moderately warm diluted hydrochloric acid, followed by three or four lots of warm water, then with alcohol, and, lastly, with ether. The tube is next warmed at about 40° C., dried by drawing a stream of dry air through it, and weighed; the asbestos is then ignited, and the loss equals the amount of mercury in the liquid examined.—Pharm. Journ., Jan. 27, 1900, 69; from Lancet, Jan. 13, 1900, 92.

Uric Acid—Determination as Ammonium Urate.—E. Woerner gives the following method for the determination of uric acid: 150 Cc. of urine is heated to 40–45° C. in a beaker and 30 Gm. of ammonium chloride is dissolved therein. The precipitate of ammonium urate is filtered, after standing about an hour, in such a manner that the precipitate is first placed

on the filter and then the mother liquor passed through. The ammonium urate is now washed free from chloride with 10 per cent. ammonium sulphate solution, and then dissolved on the filter in 1 to 2 per cent. caustic soda solution. The filter is now washed with warm water, and the filtrate and wash-water heated until all the ammonia is driven off. The ammonia free solution is now heated in a Kjeldahl flask with 15 Cc. of concentrated sulphuric acid and several crystals of copper sulphate until the solution becomes bluish-green. The cooled contents are then washed into a distillation flask, and after the addition of 60 Cc, of 33 per cent. caustic soda solution, the ammonia is distilled off into 25 to 30 Cc. of decinormal H_2SO_4 solution, which is then titrated in the usual manner. Each 1 Cc. of acid used corresponds to 0.0042 Gm. of uric acid.—Pharm. Zeits., 1900, 48.

Urea—Preparation from Guanidine. — H. Flemming calls attention to the convenient method, suggested by Baumann in 1873, of preparing urea from guanidine, the latter being now commercially available in the form of pure salts and at moderate cost. The method depends on the splitting of guanidine into urea and ammonia when a salt of guanidine is boiled with baryta water. Using equivalent quantities of the nitrate, carbonate or sulphate of guanidine—preferably the latter—and of baryta, the salt is dissolved in water, heated to boiling, and the baryta carefully added. The evolution of ammonia is immediate, and so violent that the addition must be carefully made, the reaction being ended in from 10 to 15 minutes. If carbonate or sulphate has been employed, it is now only necessary to precipitate the excess of baryta either by a current of carbonic acid or by the addition of sulphuric acid, evaporating the filtrate, and recrystallizing the commercially pure urea so obtained from alcohol for complete purification; but if guanidine nitrate has been employed, the product of the reaction is neutralized with nitric acid, the filtrate evaporated by crystallization, and extracted with alcohol, which leaves the barium nitrate undissolved, and yields pure urea on evaporation.—Apoth Ztg., Jan. 27, 1900, 63; from Chem. Ztg., 1900, 56.

Fig. 82.

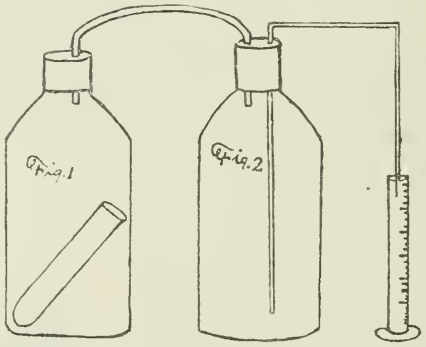


Ureometer — New Construction for Direct Urea Determination.—A. Bouriez has devised the simple modification of Dannecy's ureometer shown by Fig. 82, graduated so that the quantity of urea in a liter may be read off directly on the scale, and under the provision that 0.4 Cc. of nitrogen correspond to 0.001 Gm. of urea. The apparatus consists of a graduated glass tube, one end of which is sealed and widened to a bulb near the

extremity, while the other, cup-shaped, end is provided with two openings, as shown. Through the lateral opening, solution of sodium hypobromite (7 vols. bromine, 60 vols. soda solution, 140 vols. water) is poured until it reaches to the lowest line on the scale. Water is then carefully poured in until the highest line is reached. Then 1 Cc. of the urine is carefully poured on top of this, the lateral opening closed with a cork, the other with the finger, and the apparatus inverted and shaken vigorously. As soon as the evolution of gas ceases, as evidenced by the formation of small bubbles, the finger is removed, when a volume of fluid will flow from the inverted apparatus equal to the volume of the nitrogen generated, which is read off on the scale by the minus of liquid shown when the apparatus is restored to its original position.—Pharm. Centralh., April 19, 1900, 254; from Rep. de Pharm., 1899, 535.

Urea Apparatus—Simple and Cheap Construction.—Frederick T. Gordon has used the apparatus shown by Fig. 83 with advantage for the rapid

FIG. 83.



Gordon's Urea Apparatus.

estimation of urea, and gives the following directions for its construction and use: Procure two bottles with wide necks, about 200 Cc. capacity. Label them No. 1 and No. 2. Fit No. 1 with a rubber cork with one hole, fit No. 2 with a rubber cork having two holes, taking care that the corks fit tightly. Through No. 2's cork pass two glass tubes, one just reaching through the cork, the other extending almost to the bottom of the bottle when the cork is in and continuing on the outside in a U-shaped bend, two inches from bend to bend, and terminating in a small orifice; have this part of the tube about the same length as that in the bottle. In No. 1 fit a tube that extends an inch or so on each side of the cork, connect the two short tubes with a piece of rubber tubing, about six inches long, thus connecting the inside space of the two bottles. To use: Fill No. 2 with water to the top, press down the cork and allow excess to escape.

There must be no after-dropping from the small orifice, as this would show imperfect connections. (No. 2 must be absolutely full of water without a single air-bubble under the cork; sometimes when No. 1's cork is pressed in, a little water will be forced out, but so long as there is no space in No. 2 not filled with water it is all right.) Into No. 1 put a mixture of about a dram or so of fresh chlorinated lime rubbed up with enough water to fill the bottle one-third full; lower into No. 1 a test-tube containing exactly 5 Cc. of urine to be tested, so that the mouth of the test-tube will be above the liquid lime mixture. Now see again that No. 2 is full of water and that all connections are air-tight, place a graduated measuring jar under the small orifice of the U-tube and mix the urine and the chlorinated lime mixture by slow inversion of the bottle, allowing the urine to flow out of the test-tube. When the urine and the lime solution mix, an immediate evolution of nitrogen will begin, which will pass over to No. 2 and displace an amount of water equal to its measure, this water flowing out of the U-tube into the jar. When the action has ceased (about fifteen minutes), read off the number of Cc. of water in the jar. This will give the measure of the nitrogen evolved; multiply the number read off by 0.00278. This will give the amount of urea in 5 Cc. of urine; this multiplied by 20 will give the percentage of urea in the sample. With due care this method is very exact and very satisfactory, as the possibility of error is small; 1.0 Cc. of nitrogen is equal to 0.00278 Gm. of urea.—Amer. Drugg., March, 1900, 205.

APPENDIX.

SUPPLEMENTARY REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, APRIL 1, 1900, TO JULY 1, 1900.

RECEIPTS.

Cash on hand April 1, 1900		$784 31
Received from the sale of Proceedings		7 00
Received from the sale of 1 Certificate @ $5.00		5 00
Received from the sale of 3 Certificates @ $7.50		22 50
Received from the sale of Badges		51 70
Received from Interest on Deposit in New England Trust Company, Boston		17 62
Received from the Ebert Fund		28 00
Received for Annual Fees, 1893	$5 00	
Received for Annual Fees, 1894	5 00	
Received for Annual Fees, 1895	5 00	
Received for Annual Fees, 1896	5 00	
Received for Annual Fees, 1897	20 00	
Received for Annual Fees, 1898	135 00	
Received for Annual Fees, 1899	235 00	
Received for Annual Fees, 1900	2,675 00	
Received for Annual Fees, 1901	10 00	
		3,095 00
Received from the sale of National Formulary		117 96
Total		$4,129 09

DISBURSEMENTS.

1900.			
May	12.	Check No. 816. George F. Payne, Special Committee on Status of Pharmacists in the Army and Navy of the United States	$38 97
	12.	Check No. 817. John S. Bridges & Co., Special Committee on Practical Pharmacy and Dispensing $11 75 Printing and Stationery 30 00	41 75
	12.	Check No. 818. F. E. Stewart, Miscellaneous	3 85
	12.	Check No. 819. Henry Briele, Badges	21 00
	12.	Check No. 820. Caswell A. Mayo, Committee on Transportation	8 35
	12.	Check No. 821. Henry M. Whelpley, Committee on Membership	25 50
	21.	Check No. 822. J. A. Koch, Section on Education and Legislation	6 17

	21.	Check No. 823. Wickersham Printing Company, Proceedings	$10 35	
		Miscellaneous	17 45	
				$27 80
	21.	Check No. 824. S. A. D. Sheppard, Traveling Expenses.		62 95
	21.	Check No. 825. Chas. Caspari, Jr., Traveling Expenses..		21 00
	31.	Check No. 826. Chronicle Publishing Company, Committee on Membership		15 25
	31.	Check No. 827. J. O. Schlotterbeck and A. van Zwaluwenburg, J. M. Maisch Prize		50 00
	31.	Check No. 828. Henry Kraemer, Third General Prize...		20 00
	31.	Check No. 829. Edward Kremers and Oswald Schreiner, Second General Prize		30 00
	31.	Check No. 830. A. B. Prescott and H. M. Gordin, First General Prize		50 00
	31.	Check No. 831. Edward Kremers and Oswald Schreiner, The Ebert Prize		28 00
June	1.	Check No. 832. Henry P. Hynson, Special Committee on Practical Pharmacy and Dispensing		22 60
	11.	Check No. 833. S. A. D. Sheppard, Second half-year's salary as Treasurer, 1899–1900		375 00
	11.	Check No. 834. George W. Kennedy, Second half-year's salary as Secretary of Committee on Membership, 1899-1900	$75 00	
		Second half-year's salary as Secretary of Council, 1899-1900	75 00	
				$150 00
	11.	Check No. 835. Chas. Caspari, Jr., Second half year's salary as General Secretary, 1899–1900		500 00
	14.	Check No. 836. C. Lewis Diehl, Second half year's salary as Reporter on Progress of Pharmacy, 1899–1900		375 50
	14.	Check No. 837. Wickersham Printing Company, National Formulary	$286 80	
		Proceedings	6 00	
				292 80
	20.	Check No. 838. Allen & Co., Printing and Stationery...		54 30
	20.	Check No. 839. J. J. McLean, Services as Stenographer.		150 00
				$2,370 29

SUMMARY OF DISBURSEMENTS, APRIL 1, 1900, TO JULY 1, 1900.

Proceedings	$16 35
Stenographer	150 00
Salaries—Second half of year 1899–1900	1,400 00
Traveling Expenses	83 95
Section on Education and Legislation	6 17
Committee on Membership	40 73
Committee on Transportation	8 35
Special Committee on Status of Pharmacists in the Army and Navy of the United States	38 97
Special Committee on Practical Pharmacy and Dispensing	34 55
Printing and Stationery	84 30

Badges	21 00
Prizes	150 00
Ebert Prize	28 00
Miscellaneous Expenses	21 20
National Formulary	286 80
Total Amount of Disbursements	$2,370 29
Cash on hand July 1, 1900	1,758 80
Total	$4,129 09

Respectfully submitted,

Boston, July 1, 1900. S. A. D. SHEPPARD, *Treasurer.*

SUPPLEMENTARY REPORT OF FINANCIAL ACCOUNTS IN THE CARE OF THE GENERAL SECRETARY.

A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF NATIONAL FORMULARY, FROM APRIL 1 TO JUNE 30, 1900.

I. Receipts.

From sales and payment of bills due April 1, 1900	$117 96

II. Expenses.

Composition, plates, paper and press-work (10,000 copies Physicians' Epitome, National Formulary	$263 55	
Binding 500 copies Physicians' Epitome @ 4¼ c	21 25	
Imprint, $1; expressage, $1	2 00	
		286 80

III. Remittances.

To Treasurer, as per Treasurer's receipts	117 96

IV. Sales.

To dealers and individuals, as per ledger accounts	105 48

B. SUMMARY OF TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF NATIONAL FORMULARY SINCE 1888.

Receipts to April 1, 1900 (see Report, page 53)		$11,496 44
Receipts from April 1 to June 30, 1900		117 96
		$11,614 40
Expenses to April 1, 1900 (see Report, page 53)	$6,743 61	
Expenses April 1 to June 30, 1900	286 80	
		$7,030 41
		$4,583 99

C. SALE OF PROCEEDINGS.

From April 1 to June 30, 1900	$7 00
Remitted to Treasurer as per Treasurer's receipt	7 00

D. ACCOUNT OF BADGES AND BARS.

	Badges.	Bars.
On hand April 1, 1900 (see Report, page 53)	27	69
Received May 5, 1900, from H. Briele, Manf	0	30
	27	99

Badges sold from April 1 to June 30, 1900, 14@$2.00	$28 00	
Bars sold from April 1 to June 30, 1900, 30@75 cts.;	22 50	
" " " 2@60 cts.	1 20	
		$51 70
Remitted to Treasurer, as per Treasurer's receipt		$51 70
Balance on hand July 1, 1900: Badges, 13; Bars, 67.		
Total receipts to April 1, 1900 (see Report, page 53)	$769 90	
Receipts from April 1 to June 30, 1900	51 70	
		$821 60
Total cost of Badges and Bars to April 1, 1900 (see Report, page 53)	$754 35	
Cost of 30 Bars, May 5, 1900	21 00	
		$775 35

CHAS. CASPARI, JR., *General Secretary.*

Baltimore, July 1, 1900.

ALPHABETICAL LIST OF NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED BY THE TREASURER FOR ANNUAL DUES OR CERTIFICATES, FROM JULY 1, 1899, TO JULY 1, 1900.

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Adamick, Gustave H .....'00	$5 00		Amount brought forward	$300 00	$5 00
Aimar, Charles P.....'99	5 00		Blakely, George C.....'98-'99	10 00	
Alexander, Charles E.....'99	5 00		Blanding, William O .....'00	5 00	
Allison, William O .....'00	5 00		Blank, Alois .....'99	5 00	
Alpers, William C... .....'00	5 00		Bley, Alphonso A. W.....'00	5 00	
Alpers, William H.....'99,-'00	10 00		Blumauer, Louis .....'99	5 00	
Amend, Bernard G .....'00	5 00		Bobbitt, James H .....'99	5 00	
Amend, Otto P.....'99	5 00		Boeddiker, Otto.....'00	5 00	
Anderson, Samuel.....'99	5 00		Boehm, Solomon .....'99	5 00	
Anderson, William C .....'00	5 00		Boerner, Emil L ..... '99	5 00	
Andriessen, Hugo.....'99	5 00		Bohn, Carl H. .....'99	5 00	
Appleby, Samuel N ..... '99	5 00		Bond, John B .....'99-'00	10 00	
Aquaro, Joseph.....'00	5 00		Borell, Henry A .....'99-'00	10 00	
Arnold, Charles F .....'99	5 00		Bowen, William A .....'98	5 00	
Arny, Harry V ..... '99-'00	10 00		Boyd, Charles N .....'00	5 00	
Asplin, John H.....'97	5 00		Boyd, George W.....'99-'00	10 00	
Aughinbaugh, David C .....'00	5 00		Boyden, Edward C.....'00	5 00	
Averill, William H .....'99	5 00		Boynton, Herschell.....'99	5 00	
Axness, Ole M .....'99	5 00		Brack, Charles E .....'99-'00	10 00	
Bailey, Frederick .....'00	5 00		Bradbury, Wymond H ...'99-'00	10 00	
Baird, Julian W.....'00	5 00		Bradley, Theodore J...·····'00	5 00	
Baker, Edwin .....'00	5 00		Braunwarth, Alice L .....'00	5 00	
Baker, Maury D .....'99	5 00		Brickman, Arthur O.....'00	5 00	
Baker, T. Roberts .....'00	5 00		Briggs, Andrew G.....'99	5 00	
Ball, Charles E.....'00	5 00		Brisley, Harry .....'99	5 00	
Ballard, John W .....'00	5 00		Broe, James A .....'99	5 00	
Balser, Gustavus .....'00	5 00		Brooks, George W .....'00	5 00	
Barbat, Josephine E .....'00	5 00		Brown, Albert E.....'99-'00	10 00	
Baridon, Louis R.....'00	5 00		Brown, George S.... .....'00	5 00	
Barksdale, George E .....'00	5 00		Brown, William A... .....'00	5 00	
Barnett, Joel J .....'99-'00	10 00		Brown, William T.....'99	5 00	
Bartells, George C.....'99	5 00		Bruce, James .....'97-'98-'99	15 00	
Bartley, Elias H..... '00	5 00		Bruck, Philip H .....'00	5 00	
Base, Daniel.....'99-'00	10 00		Brunner, Norman L.....'99	5 00	
Bassett, Charles H .....'99	5 00		Bulger, Alvin H .....'99	5 00	
Baughman, John H.....'99	5 00		Bunker, Elihu .....'99	5 00	
Baur, Jacob..... .....'00	5 00		Burg, John D.....'99	5 00	
Bayly, Charles A ....'97-'98-'99	15 00		Burgess, William G.....'99-'00	10 00	
Beardmore, William A ...'98-'99	10 00	$5 00	Burgheim, Jacob.....'00	5 00	
Bechberger, Henry .....'97-'98	10 00		Burkhardt, Mark A ..'97-'98-'99	15 00	
Beck, John G .....'99	5 00		Burnham, Alfred A. Jr .....'00	5 00	
Behrens, Emil..... 99	5 00		Burrough, Horace.....'00	5 00	
Beitenman, Wm. W .....'00	5 00		Burwell, Arthur C.....'99	5 00	
Bell, Emil R.....'99-'00	10 00		Butler, Charles H .....'00	5 00	
Bell, S. Howard.....'00	5 00		Butler, Freeman H.....'00	5 00	
Bennett, James N .....'00	5 00		Button, Charles E .....'00	5 00	
Benton, Wilber M..... '99-'00	10 00		Byers, H. C.....'00	5 00	
Beringer, George M ..'98-'99-'00	15 00		Byrne, John ....'00	5 00	
Betzler, Jacob.....'99	5 00		Cambier, Jacob .....'99	5 00	
Beyschlag, Charles ..... '00	5 00		Cameron, Donald L.....'99-'00	10 00	
Bigelow, Clarence O .....'00	5 00		Campbell, George D.....'00	5 00	
Billings, Henry M .....'99	5 00		Capper, William E .....'98	5 00	
Bingham, Charles C .....'99	5 00		Cardwell, James R .....'99	5 00	
Bingham, William E .....'99	5 00		Carlson, Swan B.....'99-'00	10 00	
Bishop, Samuel E .....'99	5 00		Carpenter, Alfred B.....'99	5 00	
Blackmore, Henry S .....'99-'00	10 00		Carrell, Eugene A.....'99	5 00	
Blake, James E.....'99	5 00		Carslake, George M.....'99	5 00	
Blakely, Collins .....'99-'00	10 00		Carter, Frank H .....'99	5 00	
Amount carried forward.....	$360 00	$5 00	Amount carried forward	$715 00	$5 00

	Annual Dues.	Certificates.
Amount brought forward	$715 00	$5 00
Carver, Frank H.... ....'97–'98	10 00	
Case, Charles H. .....'99	5 00	
Caspari, Charles, Jr. .....'00	5 00	
Caspari, William, Jr. .....'99	5 00	
Casper, Thomas J. .....'00	5 00	
Cassaday, O. U. .....'99–'00	10 00	
Chabot, David P. .....'00	5 00	
Chandler, Charles F. .....'00	5 00	
Chapin, Fred. H. .....'99	5 00	
Chapman, Isaac C. .....'99–'00	10 00	
Charroppin, Emile L .....'00	5 00	
Chelf, Thomas W. .....'00	5 00	
Church, Merton E. .....'99	5 00	
Claflin, Walter A. .....'99	5 00	
Clark, John A. .....'99	5 00	
Cliffe, William L. .....'99–'00	10 00	
Cline, Raoul R. D. .....'99–'00	10 00	
Cobb, Ralph L. .....'00	5 00	
Coblentz, Virgil .....'99	5 00	
Cole, Howson W. .....'99–'00	10 00	
Colen, James A.. .....'99	5 00	
Collins, Albert B. .....'00	5 00	
Cone, John W. .....'99	5 00	
Conrath, Adam .....'00	5 00	
Cook, Gilbert S .....'98–'99–'00	15 00	
Cook, Thomas P... .....'00	5 00	
Cornell, Edward A. .....'99	5 00	
Corning, Albion J. 99	5 00	
Coupe, Robert E. .....'99	5 00	
Cowan, John.....'98–'99–'00	15 00	
Cramer, Max .....'00	5 00	
Crampton, Ferd. L. .....'00	5 00	
Crecelius, Charles E .....'00	5 00	7 50
Criswell, Francis M .....'99–'00	10 00	
Cronheim, Solomon .....'98	5 00	
Crowdle, John E. .....'99	5 00	
Crum, John D. .....'97–'98	10 00	
Curry, Gordon L. .....'00	5 00	
Dadd, Robert M. .....'00	5 00	
Danek, John F. .....'00	5 00	
Dare, Charles F. .....'99	5 00	
D'Avignon, J. Eugene ...'99–'00	10 00	
Davis, Charles L .....'00	5 00	
Davis, Edward B..... .....'97	5 00	
Davis, Eugene M. ....'97–98–'99	15 00	
Davis, John A.....'97–'98–'99	15 00	
Davis, William M.....'99–'00	10 00	
Dawson, John H. .....'99	5 00	
Day, William B. .....'99	5 00	
De Graffe, Bertha L..'98–'99–00	15 00	
De Jonge, Cornelius .....'99–'00	10 00	
De Lang, Alfred .....'99	5 00	
Dennin, Charles.... .....'99	5 00	
Dennin, Edwin C. .....'99	5 00	
Depeyre, Louis N.....'97–'98	10 00	
Devine, John..... .....'99–'00	10 00	
Dewender, William H. .....'00	5 00	
Dewoody, William L.....'99–'00	10 00	
Dickinson, Arthur L. .....'00	5 00	
Diebert, Thomas I .....'99–'00	10 00	
Diehl, C. Lewis .....'99	5 00	
Diekman, George C. .....'00	5 00	
Dill, J. Byron.....'97	5 00	
Dilly, Oscar C.. .....'99–'00	10 00	
Dimmitt, Addison....'98–'99–'00	15 00	
Dimock, Robert H. .....'00	5 00	
Dinkler, Frank A.....'00–'01	10 00	
Dixon, J. Marion..... .....'00	5 00	
Dobbins, Edward T. .....'00	5 00	
Dodd, Simon W.....'97–'98	10 00	
Dohme, Alfred R. L.....'99–'00	10 00	
Dohme, Charles E. .....'99	5 00	
Dohme, C. Louis.....'99	5 00	
Donaghue, James .....'00	5 00	
Donaghue, Theresa V.....'00	5 00	
Amount carried forward	$1245 00	$12 50

	Annual Dues.	Certificates.
Amount brought forward	$1245 00	$12 50
Doty, Wirt P.... .....'00	5 00	
Dougherty, Samuel E....'98–'99	10 00	
Douglass, Henry .....'99–'00	10 00	
Douglass, Stephen W.....'99	5 00	
Downing, Benjamin F., Jr. ..'99	5 00	
Drake, Frederick I.....'99–'00	10 00	
Drew, Walter T. .....'99	5 00	
Druehl, Frank A. .....'99	5 00	
Duble, Jesse B. 99	5 00	
Du Bois, William L.....'98–'99	10 00	
Duckett, Walter G. .....'99–'00	10 00	
Duggan, James.....'99–'00	10 00	
Dunn, John A. .....'00	5 00	
Durban, Sebastian C. ....'97–'98	10 00	
Durkee, William C. .....'99	5 00	
Eads, Robert I. .....'99	5 00	
Eagny, James T. .....'00	5 00	
Easterday, Herbert C....'99–'00	10 00	
Eberbach, Ottmar. .....'99	5 00	
Eberle, Eugene G. .....'00	5 00	
Eccles, Robert G .....'00	5 00	
Eckstein, Andrew J. .....'00	5 00	
Eddy, Henry C. .....'99	5 00	
Edwards, Frederick B. .....'99	5 00	
Eger, George..... .....'99	5 00	
Ehrlicher, Henry M..... ...'99	5 00	
Eichrodt, Chas. W. .....'99	5 00	
Einstein, Morris.....'00	5 00	
Eliel, Leo .....'99	5 00	
Elliott, Charles H.....'99–'00	10 00	
Emich, Columbus V. ..... '99	5 00	
England, Joseph W.....'98–'99	10 00	
Englander, Samuel .....'99	5 00	
Erb, Charles S .....'99	5 00	
Eschman, F. W. R.....'98	5 00	
Esters von Krakau, W. .....'99	5 00	
Estes, Joseph J. .....'99	5 00	
Evans, Joseph S. .....'99	5 00	
Ewell, Ervin E. .....'99–'00	10 00	
Ewing, John .....'99–'00	10 00	
Ewing, Mary S. ..... '99	5 00	
Eyssell, George. .....'00	5 00	
Faber, Walter E. .....'00	5 00	
Fairchild, Benjamin T. .....'00	5 00	
Fairchild, Samuel W. .....'00	5 00	
Falk, John C. .....'00	5 00	
Farrar, Samuel R.. .....'98	5 00	
Faulkner, Garland E. .....'99	5 00	
Feidt, George D. .....'00	5 00	
Feil, Joseph. .....'99	5 00	
Fennel, Charles T. P....'98–'99	10 00	
Fieber, Gustavus A..... ...'00	5 00	
Field, Claud .....'99	5 00	
Field, William C.....'99 '00	10 00	
Finch, Charles S..... .....'00	5 00	
Firmin, John C. .....'99	5 00	
Fish, Charles F. .....'99	5 00	
Fisher, Elbert E. .....'99	5 00	
Fisher, George W.....'99–00	10 00	
Flemer, Lewis. .....'99–'00	10 00	
Fletcher, John W. .....'00	5 00	
Flexon, Charles ... .'99	5 00	
Ford, Charles M ....'98–'99–'00	15 00	
Forston, Keene R. .....'99	5 00	
Fouch, William M. .....'99–'00	10 00	
Foulke, James .....'99	5 00	
Fox, Peter P. .....'00	5 00	
Frames, J. Fuller.....'99	5 00	
Frank, Herman O. .....'00	5 00	
Franzoni, Joseph D. .....'00	5 00	
Fraser, Horatio N. .....'00	5 00	
Frauer, Herman E. .....'99	5 00	
Frohwein, Richard .....'99	5 00	
Frost, William A. .....'99	5 00	
Frye, George C. .....'00	5 00	
Amount carried forward	$1715 00	$12 50

	Annual Dues.	Certificates.
Amount brought forward	$1715 00	$12 15
Gallagher, John C.....'99	5 00	
Galt, Edward P.....'97	5 00	
Gammon, Irving P.....'99	5 00	
Gane, Eustace H.... .....'99	5 00	
Gardner, Robert W.....'00	5 00	
Gaus, Chas. H.....'99	5 00	
Gayle, John W.... ....'00	5 00	
Geisler, Joseph F.....'99	5 00	
Gessner, Emil A.....'00	5 00	
Gill, George ..... co	5 00	
Gleghorn, James S.....'00	5 00	
Gleim, John C.....'00	5 00	
Glick, Harry E.....'00	5 00	
Glover, Wm. H..... .....'99	5 00	
Godbold, Fabius C.....'99-'00	10 00	
Godding, John G.....'99	5 00	
Golden, Lee H.....'co	5 00	
Goldmann, Oscar.....'00	5 00	
Goldsborough, Chas. H..'99-'00	10 00	
Good, James M.....'99	5 00	
Goodale, Harvey G.....'99	5 00	
Gordon, Frederick J.....'00	5 00	
Gordin, Harry M.....'99	5 00	
Gorgas, George A. .....'00	5 00	
Gosman, Adam J.....'00	5 00	
Graham, Clarence M.....'98-'99	10 00	
Grambois, Augustin .....'97-'98	10 00	
Grassly, Chas. W.....'99-'00	10 00	
Gray, Henry R.....'09-'00	10 00	
Gray, William.....'99-'00	10 00	
Green, Benjamin.....'99-'00	10 00	
Greene, Lester H.....'99	5 00	
Greer, Samuel R.....'oc	5 00	5 00
Gregorius, George.....'99	5 00	
Gregory, Willis G. .....'99	5 00	
Greve, Charles M.....'00	5 00	
Grever, Julius .....'99	5 00	
Griffith, Charles.....'00	5 00	
Gross, Charles E.....'00	5 00	
Gross, Edward Z .....'99	5 00	
Grossjohann, Ernst.....'00	5 00	
Guerin, James F .....'99	5 00	
Guise, P. Nettleton.....'99-'00	10 00	
Haake, William H.....'00	5 00	
Hall, Edwin B .....'00	5 00	
Hall, Horace B.....'99	5 00	
Hall, Joseph P.....'00	5 00	
Hall, William A.....'99	5 00	
Hallberg, Carl S. N.....'99-'00	10 00	
Hammar, Alrik.....'00	5 00	
Hammel, Joseph .....'99	5 00	
Hancock, C.W. '96-'97-'98-'99-'00	25 00	
Hancock, John F.....'99	5 00	
Hannan, Owen B.....'98-'99	10 00	
Harper, Robert N.....'00	5 00	
Harris, Francis M..... ...'99	5 00	
Harrison, Richard H. M. '98-'99	10 00	
Harrison, Robert L.....'00	5 00	
Harrison, William J.....'00	5 00	
Hartshorn, Frederick A.....'00	5 00	
Hartwig, Otto J.....'99	5 00	
Hassebrock, Henry F.....'99	5 00	
Hassinger, Samuel E. R.....'00	5 00	
Hatton, Edgar M.....'00	5 00	
Hatton, Ellmore W.....'00	5 00	
Havenhill, L. D.....'00	5 00	
Hay, Charles L.....'99	5 00	
Hay, Edward A.... .....'99-'00	10 00	
Hayes, Horace P.....'00	5 00	
Hayes, James H.....'99	5 00	
Haynes, David O. .....'00	5 00	
Hazlett, James L.....'00	5 00	
Hechler, George L.....'99-'00	10 00	
Heebner, Charles F.....'99	5 00	
Heim, Henry. .....'00	5 00	
Amount carried forward.....	$2180 00	$17 50

	Annual Dues.	Certificates.
Amount brought forward	$2180 00	$17 50
Heinemann, Otto.....'99	5 00	
Heinitsh, Sigmund W.....'co	5 00	
Helfman, Joseph .....'00	5 00	
Hemm, Francis.....'99	5 00	
Hemm, Louis P.....'99-'00	10 00	7 50
Henderson, Archibald K.....'00	5 00	
Hengst, J. Edwin.....'00	5 00	
Henry, Charles.....'99-'00	10 00	
Henry, Charles L .....'99-'00	10 00	
Henry, Frank C .....'99-'00	10 00	
Hepburn, John.....'00	5 00	
Herbst, William P.....'99-'00	10 00	
Hereth, Frank S.....'00	5 00	
Heschong, John F.....'00	5 00	
Hess, Paul L.....'99	5 00	
Heydenreich, Emile. .....'00	5 00	
Hickerson, William H.....'00	5 00	
Hicks, Henry T.....'99	5 00	
Hirseman, Felix.....'00	5 00	
Higgins, Albert W.....'99-'00	10 00	
Hill, Frederick J.....'99	5 00	
Hilton, Samuel L.....'99-'00	10 00	
Hiriat, Sebastian.....'99	5 00	
Hitchcock, John E.....'99	5 00	
Hoch, Aquila.....'99	5 00	
Hogan, John J.....'00	5 00	
Holliday, Francis E .....'00	5 00	
Holmes, Henry E.....'98-'99	10 00	
Hood, Charles I..... .....'00	5 00	
Hopkins, Zerah B.....'00	5 00	
Hopp, Lewis C.....'99	5 00	
Horn, Wilbur F. .....'99	5 00	
Houghton, E. Mark.....'99-'00	10 00	
Hover, William H.....'00	5 00	
Howard, Fletcher .. ..'98-'99	10 00	
Howell, Edward V.....'co	5 00	
Howey, John J.....'99	5 00	
Howson, Arthur B.....'99-00	10 00	
Huder, Henry J.....'99	5 00	
Hudnut, Richard A.....'99	5 00	
Hudson, Arthur .....'99	5 00	
Huested, Alfred B.....'00	5 00	
Huhn, George .....'99	5 00	
Huntington, William H.....'00	5 00	
Hurd, John C.....'00	5 00	
Hurlebaus, George W....'99-'00	10 00	
Hurty, John N.....'98-'99	10 00	
Huston, Charles..... .....'00	5 00	
Hutton, Harry D..... ..'99-'00	10 00	
Hynson, Henry P.....'00	5 00	
Ink, Charles E.....'98-'99	10 00	
Ires, Orvin Francis .....'00	5 00	
Jackman, Wilbur F.....'99-'00	10 00	
Jackson, Frank A.....'co	5 00	
Jackson, William J.....'00	5 00	
Jacobs, Joseph .....'99-'00	10 00	
Jelliffe, Smith E.....'98-'99	10 00	
Joergensen, Sophus.....'99-'00	10 00	
Johnson, Charles B.....'00	5 00	
Johnson, D. Dudley.....'99	5 00	
Johnson, Joseph H..... ...'99	5 00	
Jones, Alexander F.....'00	5 00	
Jones, David F..... ....'98-'99	10 00	
Jones, Simon N.....'99-'00	10 00	
Jorgenson, Hans C.....'99	5 00	
Joy, Edwin W.....'98-'99	10 00	
Jungmann, Julius.....'99	5 00	
Kaemmerer, Wm. F.....'99-'0c	10 00	
Kalish, Julius.....'00	5 00	
Kalish, Oscar G.....'00	5 00	
Kauffman, George B.....'00	5 00	
Keaney, James J..... .....'99	5 00	
Kebler, Lyman F.....'98-'99	10 00	
Keenan, Thomas J.....'99-'00	10 00	
Keeney, Caleb R..... ...'00	5 00	
Amount carried forward.....	$2680 00	$25 00

	Annual Dues.	Certificate.
Amount brought forward	$2680 00	$25 00
Kemp, Edward.....'00	5 00	
Kennedy, Ezra J.....'99-'00	10 00	
Kennedy, Geo. W.....'99-'00	10 00	
Kent, Henry A., Jr.....'99-'00	10 00	
Keppler, Christian L. '97-'98-'99	15 00	
Kerr, William W.....'97-'98-'99	15 00	
Kettler, Edward J.....'00	5 00	
Kiedaisch, John F., Jr.....'00	5 00	
Kienth, Hans .....'00	5 00	
Kilmer, Frederick B.....'00	5 00	
Kimball, Richard H.....'00	5 00	
King, George A. N.....'99	5 00	
Kirchgasser, William C.....'00	5 00	
Kirchhofer, Paul.....'99	5 00	
Kirk, James E.....'99	5 00	
Kirkland, Derwentwater... .'00	5 00	
Klein, Ernest F.....'00	5 00	
Klein, Frederick.....'00	5 00	
Klie, G. H. Charles.....'99	5 00	
Klor, A. E. G.....'99-'00	10 00	
Knabe, Gustavus A.....'99	5 00	
Knight, William C.....'00	5 00	
Knoebel, Thomas.....'00	5 00	
Knoefel, Bruno.....'99-'00	10 00	
Knoefel, Chas. D.....'99-'00	10 00	
Knox, James W. T.....'99-'00	10 00	
Koch, Julius A .....'99	5 00	
Koch, Louis .....'00	5 00	
Kolb, William W. .....'00	5 00	
Kornmann, Henry.....'99	5 00	
Kraemer, Henry.....'99-'00	10 00	
Krause, John .....'00	5 00	
Kremers, Edward ....'00	5 00	
Krewson, William E.....'97-'98	10 00	
Krieger, Philip.....'00	5 00	
Krueger, Owen W. .....'99	5 00	
Kuder, William F.....'99-'00	10 00	
La Pierre, Elie H.. .....'00	5 00	
Lachance, Seraphin.....'96-'00	10 00	
Laing, Alfred A.....'99	5 00	
Laird, John.....'00	5 00	
Lampa, Robert R. .....'99	5 00	
Lanctot, Henri .....'99	5 00	
Latin, George.....'00	5 00	
Lauricella, Felice.....'99	5 00	
Layton, Thomas. .....'99	5 00	
Legel, John G.....'00	5 00	
Legendre, Joseph A. .....'99	5 00	
Lehman, Louis. .....'99-'00	10 00	
Leis, George .....'97-'98	10 00	
Lernhart, August.....'00	5 00	
Leverty, John A.....'00	5 00	
Levinson, Joseph.....'00	5 00	
Levy, William M.....'97-'98-'99	15 00	
Lewis, Ernest G..... ...'99	5 00	
Ligon, John T.....'00	5 00	
Lillie, Foress B.....'00	5 00	
Lilly, Josiah K.....'99	5 00	
Lincoln, Geo. W..... .....'99	5 00	
Lindvall, Gus.....'00	5 00	
Lockert, Charles L.....'99	5 00	
Lockie, James A. .....'99	5 00	
Lohmann, Herman J.....'97-'98	10 00	
Lohmeyer, Henry L.....'00	5 00	
Loomis, John C. .....'99	5 00	
Lord, Frank J.....'99	5 00	
Lord, Thomas .....'99-'00	10 00	
Lovis, Henry C. .....'99	5 00	
Lovvorn, James L..... .....'99	5 00	
Lowd, John C.....'00	5 00	
Lowe, Clement B.....'99-'00	10 00	
Lowe, John W.....'00	5 00	
Lowell, Edward M.....'00	5 00	
Lueder, Fritz ....'00	5 00	
Lynch, Frank K.....'99	5 00	
Amount carried forward	$3165 00	$25 00

	Annual Dues.	Certificate.
Amount brought forward	$3165 00	$25 00
Lyon, George C.....'99-'00	10 00	
Lyons, Albert B.....'99-'00	10 00	
Lyons, Fred. W. .....'99	5 00	
Lyons, Isaac L.....'00	5 00	
MacRae, John Y..'97-'98-'99-'00	20 00	
Macnair, Whitmel H.....'99-'00	10 00	
Macy, Sherman R..... 99-'00	10 00	
Maguire, Edward S.....'00	5 00	
Main, Thomas F.....'00	5 00	
Maisch, Henry..... .....'99	5 00	
Maisch, H. C. C..'93-'94-'95-'00	20 00	
Major, Oscar.....'99	5 00	
Major, John R .....'99-'00	10 00	
Mansfield, Samuel .....'99-'00	10 00	
Markoe, George B.....'99	5 00	
Martin, John C.....'99-'00	10 00	
Mason, Harry B.....'99	5 00	
Massie, Paul.....'99	5 00	
Matson, George H., Jr...'99-'00	10 00	
Matthews, Charles E.....'00	5 00	
Matusow, Harry ... .'99	5 00	
May, Charles C. .....'99	5 00	
May, Edward.....'99-'00	10 00	
May, Eugene .....'00	5 00	
May, James O..... ...'99-'00	10 00	
McClearn, Henry T.....'98-'99	10 00	
McConnell, Chas. H.....'99-'00	10 00	5 00
McDonald, George .....'99	5 00	
McElhenie, Thomas D.....'99	5 00	
McGill, John T..... .....'00	5 00	
McIntyre, Byron F.....'97-'98	10 00	
McIntyre, Ewen .....'00	5 00	
McIntyre, William .....'00	5 00	
McKesson, G. Clinton.....'00	5 00	
McKesson, John, Jr. .....'00	5 00	
McKinney, Robert S.....'99-'00	10 00	
McMahon, Joseph.....'99-'00	10 00	
Mead, Nehemiah P. .....'99-00	10 00	
Meisburger, William J.....'00	5 00	
Meissner, F. W., Jr.....'00	5 00	
Menk, Charles W.....'99	5 00	
Mennen, Gerhard ....'99	5 00	
Meredith, H. Lionel.....'00	5 00	
Merrell, Charles G.....'00	5 00	
Merrell, George .....'00	5 00	
Meyer, Martin M.....'99-'00	10 00	
Michaelis, Gustavus. .....'00	5 00	
Michalek, John .....'00	5 00	
Millard, David R.....'99-'00	10 00	
Miller, Charles.... .....'99	5 00	
Miller, Charles E.....'99-'00	10 00	
Miller, Emerson R.....'99	5 00	
Miller, Herman.....'99-'00	10 00	
Miller, Jacob A.....'99-'00	10 00	
Miller, T. Ashby.....'00	5 00	
Miller, Wm. H .....'00	5 00	
Milligan, Decatur.....'99-'00	10 00	
Milligan, John D.....00	5 00	
Miner, Maurice A.....'00	5 00	
Mittelbach, William .....'00	5 00	
Mix, Willis L.....'00	5 00	
Moore, John T.....'00	5 00	
Moore, Josh F.....'97-'98-'99	15 00	
Moore, Silas H..... .....'99	5 00	
Morgan, Aylmer L.....'99-'00	10 00	
Morgan, Charles .....'99-'00	10 00	
Morison, J. Louis D. .. '99-'00	10 00	
Morley, Wm. J. ..'96-97-'98-'99	20 00	
Morris, Lemuel I. .....'98-'99	10 00	
Morrison, Joseph E. .....'97	5 00	
Morse, Edward W.....'99-00	10 00	
Mosher, William W. .....'99	5 00	
Mueller, Adolphus .....'00	5 00	
Mueller, Ambrose .....'99-'00	10 00	
Muench, William.....'99-'00	10 00	
Amount carried forward	$3740 00	$30 00

	Annual Dues.	Certificate.
Amount brought forward	$3740 00	$30 00
Mulcahy, Daniel D.....'99-'00	10 00	
Multord, Henry K .....'00	5 00	
Mumma, D. Edgar .....'00	5 00	
Murphy, John P .....'00	5 00	
Murphy, John S.....'99	5 00	
Muth, George L.....'00-'01	10 00	
Muth, John C.....'00	5 00	
Muth, John S. .....'00	5 00	
Myers, Daniel.....'00	5 00	
Myers, Preston B.....'00	5 00	
Nattans, Arthur.....'99-'00	10 00	
Neal, Charles C.....'99	5 00	
Neeley, Guy M.....'00	5 00	
Newman, George A.....'99-'00	10 00	
Newton, Philo W .....'99	5 00	
Nichols, John C .....'99-'00	10 00	
Nicholson, Edgar L.....'00	5 00	
Nielson, John.....'00	5 00	
Nipgen, John A.....'00	5 00	
Nixon, Charles F.....'00	5 00	
Noll, Martin J.....'99	5 00	
Nordmann, Herman .....'00	5 00	
Norton, George E..... ....'99	5 00	
O'Gorman, Theo. V....'98-'99-'00	15 00	
O'Hare, James .....'00	5 00	
Oberdeener, Samuel .....'99	5 00	
Ogier, John M.....'00	5 00	
Oldberg, Oscar .....'98-'99-'00	15 00	
Oleson, Olaf M.. .....'99	5 00	
Oliver, William M.....'00	5 00	
Orton, Ingomar F. .....'99-'00	10 00	
Osmun, Charles A.....'99	5 00	
Ottinger, James J.....'00	5 00	
Otto, Theodor G. E.....'00	5 00	
Paine, Charles J. .....'99	5 00	
Parisen, George W .....'99	5 00	
Parsons, Charles W.....'99	5 00	
Parsons, John.....'00	5 00	
Partridge, Charles K.....'99-'00	10 00	
Partridge, Frank R.....'99	5 00	
Patch, Edgar L..... .....'99-'00	10 00	
Patrick, Elmer A.....'00	5 00	
Pattison George H.....'99	5 00	
Patton, John F.. .....'00	5 00	
Pauley, Frank C .....'99	5 00	
Payne, George F.....'99	5 00	
Peacock, Josiah C.....'00	5 00	
Pearce, Howard A.....'00	5 00	
Pease, Autumn V.....'99	5 00	
Peck, George L. ....'00	5 00	
Perkins, C. William .....'99	5 00	
Perry, Frederick W. R.....'99	5 00	
Peter, Minor C .....'99-'00	10 00	
Pfaff, Franz .....'99-'00	10 00	
Phillips, Carrie E.....'99-'00	10 00	
Phillips, Chas. W.....'00	5 00	
Phillips, Edwin F.....'99-'00	10 00	
Pieck, Edward L.....'00	5 00	
Pile, Gustavus .....'99-'00	10 00	
Pilson, Abram O .....'00	5 00	
Pine, Warren C. .....'99	5 00	
Pitt, John R .....'99	5 00	
Plaut, Albert.....'00	5 00	
Pleasants, Charles H. .....'97	5 00	
Porter, Chilton S.....'99-'00	10 00	
Porter, Millett N .....'99	5 00	
Portmann. Cæsar A. .....'99	5 00	5 00
Potter, William R. .....'99	5 00	
Potts, David G.....'00	5 00	
Powell, William C. .....'99-'00	10 00	
Powell, William D .....'99	5 00	
Preissler, Henry W.....'99	5 00	
Prescott, Albert B. .....'99-'00	10 00	
Preston, Andrew P.....'99-'00	10 00	
Preston, David.....'00	5 00	
Amount carried forward.....	$4220 00	$35 00

	Annual Dues.	Certificate
Amount brought forward.....	$4220 00	$35 00
Price, Roger T.....'99	5 00	
Priest, Carlton R .....'99	5 00	5 00
Puckner, William A.....'99-'00	10 00	
Punch, Wilham F. .....'97-'98	10 00	
Quackinbush, Benjamin F....'00	5 00	
Quandt, Arthur A. .....'00	5 00	
Quandt, Ernest E.....'00	5 00	
Rains, A. Brown .....'99	5 00	
Ramaley, Francis.....'00	5 00	
Rand, Daniel M.....'00	5 00	
Randall, Frank O.....'98	5 00	7 50
Rapelye, Charles A.....'99	5 00	
Rauch, Henry .....'00	5 00	
Reade, Frank M .....'00	5 00	
Redsecker, Jacob H. .....'99	5 00	
Reed, Willoughby H.... ....'00	5 00	
Reidy, Michael. .....'99	5 00	
Reynolds, Charles E .....'00	5 00	
Reynolds, Howard P.....'99-'00	10 00	
Reynolds, John J..... '99	5 00	
Reynolds, William K.....'98-'99	10 00	
Rhode, Rudolph E. .....'00	5 00	
Rhodes, Chas. O .....'00	5 00	
Rice, Charles.....'99-'00	10 00	
Richardson. Horatio S.....'00	5 00	
Richardson, Samuel W...'98-'99	10 00	
Richardson, Thomas L.....'99	5 00	
Richardson, Willard S. .....'00	5 00	
Riddell, Benjamin F. .....'00	5 00	
Ridgway, Lemuel A. .....'00	5 00	
Robins, Wilbur F.....'99	5 00	
Robinson, Ernest F. .....'99	5 00	
Robinson, Samuel L.	....	7 50
Rockefeller, Howard.....'00	5 00	
Rockefeller, Lucius.....'00	5 00	
Roe, William G.....'00	5 00	
Rogers, Arthur H.....'99	5 00	
Rogers, Henry H. .....'99	5 00	
Rohde, Claus F. ....'98	5 00	
Root, Wilfred F .....'00	5 00	
Rosenthal, David A.....'99-'00	10 00	
Rosenzweig. Benj. .....'99-'00	10 00	
Roth, Charles R.....'00	5 00	
Rowlinski, Robert A.....'99	5 00	
Ruddiman, Edsel A.....'99-'00	10 00	
Ruenzel, Henry G..... .....'00	5 00	
Rumsey, Samuel L. .....'00	5 00	
Ruppert, John.....'98-'99	10 00	
Rusby, Henry H.....'99-'00	10 00	
Ryan, Frank G. .....'00	5 00	
Sadtler, Samuel P.....'00	5 00	
Samson, Max .....'00	5 00	
Sanborn, George C.....'99	5 00	
Sargent, Ezekiel H..'97-'98-'99	15 00	
Sauer, Louis W. .....'99	5 00	
Sauerhering, Rudolph A.....'00	5 00	
Sawyer, Charles H.....'00	5 00	
Sawyer, William F .....'99	5 00	
Sayre, Edward A. .....'99	5 00	
Sayre. Lucius E.....'00	5 00	
Sayre, William H. .....'99	5 00	
Schæfer, Emil A. .....'00	5 00	
Schafer, George H,.....'99	5 00	
Schafhirt, Adolph J. ....'99-'00	10 00	
Scheffer, Henry W.....'99	5 00	
Scherer, Andrew.....'00	5 00	
Scherff, John P. .....'00	5 00	
Scherling, Gustav .....'99	5 00	
Schiemann, Edward B. ..'99-'00	10 00	
Schimpf, Henry W .....'99-'00	10 00	
Schlaepfer, Henry J. .....'00	5 00	
Schlotterbeck, Augustus G...'00	5 00	
Schlotterbeck, Julius O..'99-'00	10 00	
Schmid, Henry. .....'99	5 00	
Schmidt, Ferdinand T .....'00	5 00	
Amount carried forward.....	$4675 00	$55 00

	Annual Dues.	Certificates.
Amount brought forward	$4675 00	$55 00
Schmidt, Florian C..... '00	5 00	
Schmidt, Frederick M..... '00	5 00	
Schmidt, Joseph H..... '99	5 00	
Schmidt, Oscar W..... '99-'00	10 00	
Schmidt, Valentine ..... '99	5 00	
Schmitt, George J. F..... '00	5 00	
Schmitter, Jonathan..... '99	5 00	
Schneider, Albert..... '99	5 00	
Schoenhut, Christie H.... '99-'00	10 00	
Schoettlin, Albert J..... '99-'00	10 00	
Schrader, August C..... '99	5 00	
Schrank, C. Henry..... '00	5 00	
Schreirer, Oswald ..... '00	5 00	
Schueller, Frederick W..... '00	5 00	
Schuh, Paul G..... '00	5 00	
Schulze, Louis..... '99-'00	10 00	
Schumacher, Albert C. ..... '00	5 00	
Schurk, Louis ..... '99	5 00	
Schweikhardt, Richard ..... '97	5 00	
Scott, George T..... '98-'99-'00	15 00	
Scott, Theodore W..... '99	5 00	
Scott, William H..... '99-'00	10 00	
Scoville, Wilbur L..... '00	5 00	
Searby, William M..... '99	5 00	
Seinsoth, John J..... '00	5 00	
Seltzer, Leonard A..... '99-'00	10 00	
Selzer, Eugene R..... '00	5 00	
Sennewald, Emil A..... '00	5 00	
Serodino, Herman..... '00	5 00	
Shafer, Edwin C..... '00	5 00	
Shannon, Thomas R..... '99	5 00	
Sharples, Stephen P..... '00	5 00	
Shaw, Robert J..... '99	5 00	
Sheehey, Henry L..... '99	5 00	
Sherman, Charles R..... '00	5 00	
Sherrard, Charles C. ..... '99-'00	10 00	
Sherwin, Eugene A..... '00	5 00	
Sherwood, Henry J..... '00	5 00	
Shoemaker, Richard M ..... '00	5 00	
Shreve, John A..... '98-'99	10 00	
Shurtleff, Israel H..... '99	5 00	
Siegemund, Charles A..... '99	5 00	
Siegenthaler, Harvey N..... '99	5 00	
Sieker, Ferdinand A..... '00	5 00	
Simon, William ..... '00	5 00	
Simpson, William..... '98	5 00	
Simson, Francis C..... '99	5 00	
Skinner, William H..... '98-'99	10 00	
Slack, Henry R..... '99-00	10 00	
Slade, Harry A..... '99-'00	10 00	5 00
Slater, Frank H. ..... '99	5 00	
Smith, B. Frank..... '99-'00	10 00	
Smith, Charles B..... '99	5 00	
Smith, Clarence P..... '99	5 00	
Smith, Edward N..... '99-'00	10 00	
Smith, Lauriston S..... '00	5 00	
Smith, Linville H..... '99	5 00	
Smith, Reuben R ..... '99-'00	10 00	
Smith, Theodric ..... '99-'00	10 00	
Smith, William A..... '99	5 00	
Smithson, David E. ..... '98-'99	10 00	
Sniteman, Charles C..... '98-'99	10 00	
Snook, William H..... '00	5 00	
Snow, Charles W..... '99-00	10 00	
Snyder, Robert J..... '99-'00	10 00	
Sohrbeck, G. Henry..... '00	5 00	
Sohrbeck, George W..... '00	5 00	
Solomons, Isaiah A..... '00	5 00	
Somhart, John E..... '98-'99	10 00	
Sords, Thomas V..... '00	5 00	
Spalding, Warren A..... '00	5 00	
Sperry, Herman J..... '00	5 00	
Sprague, Wesson G..... '00	5 00	
Squibb, Edward H..... '00	5 00	
St. Jacques, Gaston..... '00	5 00	
Amount carried forward.....	$5160 00	$60 00

	Annual Dues.	Certificates.
Amount brought forward.....	$5160 00	$60 00
St. John, Sydney S..... '00	5 00	
Staebler, Richard..... '99	5 00	
Staehle, Louis L..... '99	5 00	
Stamford, William H..... '99	5 00	
Stange, Carl F..... '99	5 00	
Staudt, Louis C..... '99	5 00	
Stearns, Frederick..... '00	5 00	
Stecher, Henry W..... '99	5 00	
Stedem, Frederick W. E..'99-'00	10 00	
Stedem, Laurence S. A ..... '00	5 00	
Steele, George R..... '99-'00	10 00	
Steiner, Samuel G..... '99	5 00	
Stevens, Alonzo V..... '99-'00	10 00	
Stewart, Francis E..... '00	5 00	
Stoddard, Thomas..... '00	5 00	
Stott, Samuel T..... '00	5 00	
Stoughton, Dwight G..... '99	5 00	
Stowell, Daniel..... '99	5 00	
Streett, Edmund O..... '99-'00	10 00	
Stroup, Freeman P..... '00	5 00	
Stuart, William A..... '99-'00	10 00	
Sweet, Caldwell..... '00	5 00	
Symonds, Arthur H..... '99	5 00	
Takamine, Jokichi ..... '99	5 00	
Taylor, Augustus C..... '00	5 00	
Taylor, George E..... '00	5 00	
Terrill, Willis E..... '99	5 00	
Thames, Joseph J..... '99-'00	10 00	
Thomas, Daniel J. ..... '00	5 00	
Thomas, John B..... '99	5 00	
Thomas, Oscar E..... '98	5 00	
Thomas, Robert, Jr..... '00	5 00	
Thomasson, Anders..... '00	5 00	
Thompson, Albert D..'97-'98-'99	15 00	
Thompson. Albert E.... '99	5 00	
Thompson, William S.... '99-'00	10 00	
Thorn, Henry P..... '00	5 00	
Thurston, Azor ..... '99	5 00	
Thweatt, Archibald..... '00	5 00	
Tigner, James O..... '99	5 00	
Tilden, Amos K..... '99	5 00	
Tobin, John M..... '99	5 00	
Todd, Albert M..... '00	5 00	
Topley, James ..... '00	5 00	
Topping, Chas. O..... '99-'00	10 00	
Torbert, Willard H..... '00	5 00	
Tracy, David W..... '99	5 00	
Treat, Joseph A..... '00	5 00	
Trefethen, Frederick J..... '99	5 00	
Treherne, John C..... '99	5 00	
Tremble, John E..... '97	5 00	
Troxler, Constantine, Jr..'99-'00	10 00	
Tucker, Greenleaf R..... '98-'99	10 00	
Turner, George H..... '98	5 00	
Turrell, Judson W... ..... '99	5 00	
Tuthill, Frederic P ..... '99	5 00	
Uhlich, Ferdinand G..... '98-'99	10 00	
Van Antwerp, Andrew ..'99-'00	10 00	
Van Antwerp, Garet..... '99-'00	10 00	
Van Winkle, Abram W ..... '99	5 00	
Vargas-Heredia, Jorge. ..... '99	5 00	
Varney, Edward F ..... '99	5 00	
Vaughan, Parry W..... '98	5 00	
Vellines, Davies..... ..'98	5 00	
Vilter, Herman T ..... '99	5 00	
Vitt, Rudolph S..... '99	5 00	
Vockroth, Emil..... '99-'00	10 00	
Voight, Joseph F..... '00	5 00	
Vonachen, Frank H..... '99	5 00	
Vordick, August H.... ..... '99	5 00	
Voss, George W..... '00	5 00	
Votteler, William..... '99-'00	10 00	
Waddell, Minor T..... '99	5 00	
Waggener, Richard..... '99	5 00	
Wagner, Henry..... '97	5 00	
Amount carried forward.....	$5620 00	$60 00

	Annual Dues.	Certificates.
Amount brought forward	$5620 00	$60 00
Walbrach, Arthur .....'98–'99	10 00	
Waldner, Paul J..... '00	5 00	
Walker, Emmette E.....'00	5 00	
Walker, John P .....'00	5 00	
Walker, Thomas A.....'00	5 00	
Walker, William J.. .....'00	5 00	
Wall, Otto A.....'99	5 00	
Walter, Charles A.....'99	5 00	
Walts, Charles C.....'99	5 00	
Wangler, Conrad D.....'00	5 00	
Ward, A. Jae .....'99	5 00	
Ward, Charles A .....'98	5 00	
Ward, George J.....'98–'99	10 00	
Ware, Charles H.....'99	5 00	
Warn, William E.....'00	5 00	
Warren, William M.....'99–'00	10 00	
Washburn, Harry M.....'98–'99	10 00	
Watson, Herbert K.....'99	5 00	
Watson, Sidney P.....'99–'00	10 00	
Watt, George H.....'99	5 00	
Watters, Henry ..... '99	5 00	
Wearn, William H .....'99	5 00	
Webb, William M .....'00	5 00	
Webber, J. LeRoy .....'00	5 00	
Weeks, B. Frank.....'97	5 00	
Weidemann, Chas. A.....'00	5 00	
Weihe, Otto A..... ..'96	5 00	
Weiss, Conrad H.....'00	5 00	
Weller, Franklin P.....'00	5 00	7 50
Wendel, H. Edward.....'99–'00	10 00	
Wenzell, William T .....'00	5 00	
Werner, Rudolf C.....'00	5 00	
Wescott, William C.....'99	5 00	
Westcott, James W.....'98–'99	10 00	
Wetterstroem, Albert.....'99	5 00	
Wetterstroem, Theo. D...'99–'00	10 00	
Whelpley, Henry M.....'99	5 00	
Whitcomb, Frederick E.....'99	5 00	
White, George H.....'97–'98	10 00	
White, Herbert E.....'99–'00	10 00	
White, Richard E.....'99	5 00	
Amount carried forward	$5875 00	$67 50

	Annual Dues.	Certificates.
Amount brought forward.	$5875 00	$67 50
Whitehead, Eugene T .....'00	5 00	
Whitman, Nelson S ... .'99	5 00	
Wichelns, Frederick.....'00	5 00	
Wickham, William H.....'00	5 00	
Wiesel, John M.....'99	5 00	
Wikle, Jesse L.....'99–'00	10 00	
Wilbur, Lot..... .....'00	5 00	
Williams, Charles F.....'98	5 00	
Williams, George G.....'99	5 00	
Williams, John K.....'99	5 00	
Williams, Richard W.....'00	5 00	
Williams, Seward W.....'99–'00	10 00	
Willis, Henry. .....'99–'00	10 00	
Wilson, Frank M .....'00	5 00	
Wilson, William .....'98–99	10 00	
Winkelmann, Harry C .....'99	5 00	
Wittich, Matthew H .....'99	5 00	
Wood, Alonzo F., Jr .....'00	5 00	
Wood, Edward S.....'00	5 00	
Wood, James P .....'00	5 00	
Wood, John W.....'00	5 00	
Wood, Mason B .....'97	5 00	
Woodman, Walter I.....'00	5 00	
Woods, Chas. H. A.....'99	5 00	
Woodward, Brinton W...'98–'99	10 00	
Wooten, Thomas V ..'97–'98–'99	15 00	
Wright, Frank C.....'00	5 00	
Wuensch, Charles.....'99	5 00	
Wulling, Frederick J.....'99	5 00	
Wunderlich, Edward ....'99–'00	10 00	
Wurmb, Theodore H.....'99	5 00	
Yarnold, Edwin .....'00	5 00	
Zemp, William R..... '00	5 00	
Ziegler, Philip M.....'99	5 00	
Zimmermann, Albert .....'00	5 00	
Zimmermann, Bernard...'99–'00	10 00	
Zimmermann, Charles.....'99	5 00	
Zoeller, Edward V.....'00	5 00	
Zuenkeler, J. Ferd .....'00	5 00	
Zwick, Karl G.....'99–'00	10 00	
Totals.....	$6125 00	$67 50

LIST OF COLLEGES AND ASSOCIATIONS

HAVING ACCREDITED DELEGATES TO THE FORTY-EIGHTH ANNUAL MEETING, HELD AT RICHMOND, VA., WITH THE NAMES OF THEIR PRESIDENTS AND SECRETARIES.

Name.	*President.*	*Secretary.*
Albany	Wm. J. Walker	De Baun Van Aken.
Chicago	A. S. Draper	Wm. B. Day.
Cleveland	E. A. Schellentrager	Joseph Feil.
Louisville	Simon N. Jones	Gordon L. Curry.
Maryland	Chas. E. Dohme	Henry P. Hynson.
Massachusetts	Wm. H. Puffer	Wm. D. Wheeler.
National	H. C. Easterday	W. H. Bradbury.
New York	Edward Kemp	Thos. F. Main.
Philadelphia	H. B. French	W. Nelson Stem.
Pittsburg	Louis Emanuel	H. L. Lohmeyer.
St. Louis	H. F. A. Spilker	J. C. Falk.

SCHOOLS OF PHARMACY.

Medico-Chirurgical College	Seneca Egbert, *Dean.*
Northwestern University	Oscar Oldberg, *Dean.*
University of Minnesota	F. J. Wulling, *Dean.*
University of Wisconsin	C. K. Adams, *Pres.*

ALUMNI ASSOCIATIONS OF COLLEGES OF PHARMACY.

Name.	*President.*	*Secretary.*
Maryland	A. P. Sharp	A. Ferd. Ries.
New York	Chas. S. Erb	W. A. Hoburg, Jr.
Philadelphia	Theo. Campbell	Wm. E. Krewson.

STATE PHARMACEUTICAL ASSOCIATIONS.

Name.	*President.*	*Secretary.*
Alabama	P. C. Candidus	L. S. Brigham.
Arkansas	E. F. Klein	J. A. Ginocchio.
California	Gaston E. Bacon	Jno. Calvert.
Connecticut	Chas. F. Williams	Chas. A. Rapelye.
Georgia	R. O. Howard	C. T. King.
Illinois	Fred. M. Schmidt	R. N. Dodds.
Indiana	F. D. Warner	A. Timberlake.
Iowa	Jno. H. Pickett	Fletcher Howard.
Kansas	R. F. Bryant	F. A. Snow.
Kentucky	Jno. J. Reynolds	J. W. Gayle.

Name.	*President.*	*Secretary.*
Maine	A. M. Robinson	M. L. Porter.
Maryland	A. R. L. Dohme	Chas. H. Ware.
Massachusetts	Wm. D. Wheeler	J. F. Guerin.
Michigan	Ottmar Eberbach	Chas. F. Mann.
Minnesota	John Nielson	E. B. Wilson.
Missouri	H. M. Pettit	H. M. Whelpley.
New Jersey	Wm. C. Alpers	F. C. Stutzlen.
New York	Wm. Muench	J. B. Todd.
North Carolina	J. B. Smith	P. W. Vaughan.
North Dakota	A. L. Lien	W. S. Parker.
Ohio	Alfred DeLang	Lewis C. Hopp.
Pennsylvania	C. N. Boyd	J. A. Miller.
Tennessee	Jesse L. Nelson	R. W. Vickers.
Texas	Jas. L. Hazlett	R. H. Walker.
Vermont	Z. B. Hopkins	W. F. Root.
Wisconsin	Chas. A. Spencer	H. Rollmann.

NATIONAL ASSOCIATIONS.

Name.	*President.*	*Secretary.*
Retail Druggists	Simon N. Jones	Thos. V. Wooten.
Wholesale Druggists	E. C. Frisbie	A. B. Merriam.

LOCAL ASSOCIATIONS.

Name.	*President.*	*Secretary.*
Cincinnati Academy of Pharmacy	Albert Wetterstroem	Robt. Groenland.
German Apothec. Soc., of City of N. Y.	Chas. F. Schleussner	Sidney Faber.
Kings County Pharm. Assoc.	A. Paradis	F. P. Tuthill.
Manhattan Pharm. Assoc.	Reuben R. Smith	Thos. J. Keenan.
Northern Ohio Druggists' Assoc	J. A. Bartlett	E. F. Hellwig.

LIST OF MEMBERS AND DELEGATES IN ATTENDANCE AT RICHMOND, VA.

Names of delegates indicated by *; delegates not members by *†.

Alpers, Wm. C., Bayonne, N. J.
* Anderson, Wm. C., Brooklyn, N. Y.
Baker, T. Roberts, Richmond, Va.
* Barbat, Josephine E., San Francisco, Cal.
Barksdale, Geo. E., Richmond, Va.
* Bartley, Elias H., Brooklyn, N. Y.
Base, Daniel, Baltimore, Md.
* Beal, James H., Scio, O.
Benfield, C. W., Cleveland, O.
* Biroth, Henry, Chicago, O.
* Blakely, Collins, Montpelier, Vt.
* Bobbitt, J. Hal., Raleigh, N. C.
* Boring, Edwin M., Philadelphia, Pa.
Boyd, Chas. N., Butler, Pa.
Bradbury, W. H., Washington, D. C.
Briggs, Andrew G., Richmond, Va.
Burgess, W. G., Newport News, Va.
Byers, H. C., Pottstown, Pa.
Cameron, D. L., Rutherford, N. J.
Caspari, Chas., Jr., Baltimore, Md.
Chelf, T. Wilber, Richmond, Va.
*† Childress, Geo. C., Knoxville, Tenn.
Cliffe, Wm. L., Philadelphia, Pa.
* Diehl, C. Lewis, Louisville, Ky.
* Diekman, Geo. C., New York, N. Y.
Dohme, Chas. E., Baltimore, Md.
Easterday, Herbert C., Washington, D. C.
* Eberle, E. G., Dallas, Tex.
* Ebert, Albert E., Chicago, Ill.
* Eccles, Robert G., Brooklyn, N. Y.
Ellis, Evan T., Philadelphia, Pa.
England, Jos. W., Philadelphia, Pa.
Flemer, Louis, Washington, D. C.
* Fieber, G. A., Cincinnati, O.
* Gayle, Jno. W., Frankfort, Ky.
* Good, Jas. M., St. Louis, Mo.
Gordin, Harry M., Ann Arbor, Mich.
Gorgas, Geo. A., Harrisburg, Pa.
Griffith, Chas., Johnstown, Pa.
Hall, Joseph P., Suffolk, Va.
* Hallberg, C. S. N., Chicago, Ill.
Hancock, Chas. W., Langhorne, Pa.
Hancock, John F., Baltimore, Md.
Harrison, R. H. M., Richmond, Va.
Harrison, Robt. L., Richmond, Va.
Hauenstein, Wm., New York, N. Y.
Helfman, Joseph, Detroit, Mich.
Henry, Chas. L., Washington, D. C.
* Hereth, Frank S., Chicago, Ill.
* Holliday, F. E., Topeka, Kan.
* Holmes, Clay W., Elmira, N. Y.
* Hopp, Lewis C., Cleveland, O.
Houghton, E. M., Detroit, Mich.
Howell, E. V., Chapel Hill, N. C.
Huested, A. B., Albany, N. Y.
* Hynson, H. P., Baltimore, Md.
Jackson, Wm. J., San Francisco, Cal.
Jacobs, Joseph, Atlanta, Ga.
Johnson, Chas. B., Middletown, O.
* Kauffman, Geo. B., Columbus, O.
Kebler, Lyman F., Philadelphia, Pa.
Kennedy, Geo. W., Pottsville, Pa.
* Klein, E. F., Hot Springs, Ark.
Klor, A. F. G., Newport News, Va.
Knoefel, Chas. D., New Albany, Ind.
Knox, J. W. T., Detroit, Mich.
* Koch, Julius A., Pittsburg, Pa.
Kremers, Edw., Madison, Wis.
Lachance, S., Montreal, Can.
* La Pierre, E. H., Cambridge, Mass.
Latin, Geo., Dayton, O.
* Lindvall, Gus., Moline, Ill.
* Lowe, Clement B., Philadelphia, Pa.
* Lowe, John W., New Haven, Conn.
* Lyons, A. B., Detroit, Mich.
Macnair, W. H., Tarboro, N. C.
MacRae, Jno. V., Raleigh, N. C.
* Macy, S. R., Des Moines, Ia.
* Maisch, H. C. C., Philadelphia, Pa.
Mason, H. B., Detroit, Mich.
* Mayo, Caswell A., New York, N. Y.
McGill, Jno. T., Nashville, N. Y.

Meissner, F. W., Jr., La Porte, Ind.
Merrell, Chas. G., Cincinnati, O.
Miller, T. A., Richmond, Va.
Miller, W. H., New Philadelphia, Pa.
Morse, Edw. W., Mt. Vernon, Ill.
Mulford, H. K., Philadelphia, Pa.
Nattans, Arthur, Baltimore, Md.
Neal, Chas. C., Danville, Va.
Nixon, Chas. F., Leominster, Mass.
Norton, Geo. E., Cambridge, Mass.
Ogier, Jno. M., Cambridge, O.
* Oldberg, Oscar, Chicago, Ill.
Paine, Chas. J., Waycross, Ga.
Parsons, Chas. W., New York, N. Y.
Patch, Edgar L., Boston, Mass.
* Patton, John F., York, Pa.
* Payne, Geo. F., Atlanta, Ga.
* Pettit, Henry M., Carrollton, Mo.
Porter, C. S., Somerset, Ky.
* Prescott, A. B., Ann Arbor, Mich.
*† Purcell, Jno. B., Richmond, Va.
* Quandt, Arthur A., Baltimore, Md.
*† Quattlebaum, M. J., Norfolk, Va.
Rains, A. E., Columbia, Tenn.
Randall, Frank O., Brockton, Mass.
* Rapelye, Chas. A., Hartford, Conn.
Rauschenberg, Sidney, New York, N. Y.
* Remington, Jos. P., Philadelphia, Pa.
Riddell, Benj. F., Fall River, Mass.
* Ruddiman, E. A., Nashville, Tenn.
* Ryan, Frank G., Philadelphia, Pa.
* Sander, Enno, St. Louis, Mo.
* Sayre, Lucius E., Lawrence, Kan.
Schlotterbeck, J. O., Ann Arbor, Mich.
* Schneider, Albert, Chicago, Ill.
Scott, Wm. H., Richmond, Va.
Seabury, Geo. J., New York, N. Y.
* Sheppard, S. A. D., Boston, Mass.
Sherrard, C. C., Detroit, Mich.
Simon, Wm., Baltimore, Md.
Simpson, Wm., Raleigh, N. C.
Skinner, Wm. H., Pocahontas, Ark.
Sloan, Geo. W., Indianapolis, Ind.
Snook, W. H., Richmond, Va.
* Stedem, F. W. E., Philadelphia, Pa.
* Stevens, A. B., Ann Arbor, Mich.
Stewart, F. E., New York, N. Y.
Taylor, Augustus C., Washington, D. C.
Thomas, O. E., Columbia, S. C.
* Thompson, Wm. S., Washington, D. C.
* Thweatt, Archibald, Humboldt, Tenn.
Vellines, Davies, Baltimore, Md.
Voigt, J. F., Chattanooga, Tenn.
Walker, E. Edward, Forksville, Va.
* Wanous, Josie A., Minneapolis, Minn.
Wescott, W. C., Atlantic City, N. J.
* Wetterstroem, Theo. D., Cincinnati, O.
* Whelpley, H. M., St. Louis, Mo.
White, Geo. H., Jersey City, N. J.
Whitehead, E. T., Scotland Neck, N. C.
Williams, S. W., East Orange, N. J.
Willis, Henry, Quebec, Can.
Zoeller, Edw. V., Tarboro, N. C.

LIST OF NEW MEMBERS.

Anderson, Wm. C., Brooklyn, N. Y.
Aquaro, Joseph, New York, N. Y.
Barbat, Josephine E., San Francisco, Cal.
Barksdale, Geo. E., Richmond, Va.
Bennett, Jas. H., Hartford, Conn.
Bigelow, Clarence O., New York, N. Y
Boyd, Chas. N., Butler, Pa.
Brown, George S., New Orleans, La.
Byers, Huizinga C., Pottstown, Pa.
Campbell, Geo. D., Lonaconing, Md.
Chelf, T. Wilber, Richmond, Va.
Crecelius, Chas. E., New Albany, Ind.
Curry, Gordon L., Louisville, Ky.
Dickinson, Arthur L., Danbury, Conn.
Dinkler, Frank A., Hennessey, Okla. Ter.
Donaghue, James, Girardville, Pa.
Donaghue, Theresa V., Girardville, Pa.
Doty, Wirt P., Detroit, Mich.
Einstein, Morris, Allegheny City, Pa.
Faber, Walter E., New York, N. Y.
Falk, John C., St. Louis, Mo.
Finch, Chas. S., Stamford, Conn.
Franzoni, Joseph D., Washington, D. C.
Gleghorn, James S., Allegheny, Pa.
Glick, Harry E., Lafayette, Ind.
Golden, Lee H., McLond, Okla. Ter.
Goldmann, Oscar, New York, N. Y.
Gordon, Fred'k T., League Island, Pa.
Greer, Samuel R., Pittsburg, Tex.
Griffith, Chas., Johnstown, Pa.
Gross, Chas. E., Washington, D. C.
Grossjohann, Ernst, Warrington, Fla.
Hall, Joseph P., Suffolk, Va.
Harper, Robert N., Washington, D. C.
Harrison, Robert L., Richmond, Va.
Havenhill, L. D., Lawrence, Kan.
Hazlett, James L., Hearne, Texas.
Heim, Henry, Saginaw, Mich.
Hengst, J. Edwin, Baltimore, Md.
Hirseman, Felix, New York, N. Y.
Holliday, F. E., Topeka, Kan.
Hopkins, Zerah B., Brandon, Vt.
Howell, Edward V., Chapel Hill, N. C.
Humma, Henry J., Metropolis, Ind.
Ires, Orrin F., Hartford, Conn.
Jackson, Frank A., Woonsocket, R. I.
Jackson, Wm. J., San Francisco, Cal.
Kalish, Oscar G., New York, N. Y.
Kimball, Richard H., Hartford, Conn.
Knight, Wm. C., Carrollton, Mo.
Krause, John, Cleveland, O.
Latin, George, Dayton, O.
Levêrty, John A., Bridgeport, Conn.
Ligon, J. Temple, Anderson, S. C.
Lillie, Foress B., Guthrie, Okla. Ter.
Lohmeyer, H. L., Pittsburg, Pa.
Maisch, Henry C. C., Philadelphia, Pa.
* Matson, Geo. H., Jr., Columbus, O.
McGill, John T., Nashville, Tenn.
Meisburger, Wm. J., Webster Groves, Mo.
Meredith, Harry L., Hagerstown, Md.
Michalek, John, Chicago Heights, Ind.
Milligan, John D., Washington, D. C.
Murphy, John P., North Andover, Mass.
Neely, Guy M., Washington, D. C.
Nicholson, Edgar L., New Whatcom, Wash.
Nixon, Chas. F., Leominster, Mass.
Otto, Theodore G. E., Columbus, Ind.
Patrick, Elmer A., Sharpsburg, Pa.
Raeuber, Edward G., Milwaukee, Wis.
Rauschenberg, Sidney, New York, N. Y.
Reade, Frank M., Richmond, Va.
Richardson, Willard S., Washington, D.C.
Rockefeller, Howard, Butte, Mont.
Roe, Wm. G., Washington, D. C.
Roth, Chas. R., Canton, O.
Samson, Max, New Orleans, La.
Schaefer, Emil A., Pittsburg, Pa.
Schreiner, Oswald, Madison, Wis.
Schumacher, Albert C., Ann Arbor, Mich.
Seinsoth, John J., Hartford, Conn.
Sennewald, Emil A., St. Louis, Mo.
Snook, W. H., Richmond, Va.
St. Jacques, Gaston, St. Hyacinthe, Can.

* Elected in 1899, but name received too late for publication in the last volume of Proceedings.

Stedem, Lawrence S. A., Philadelphia, Pa.
Stoddard, Thomas, Buffalo, N. Y.
Stott, Samuel T., Washington, D. C.
Stroup, Freeman P., Philadelphia, Pa.
Taylor, Augustus C., Washington, D. C.
Thomas, Daniel J., Scranton, Pa.
Thweatt, Archibald, Humboldt, Tenn.
Waldner, Paul J., Washington, D. C.
Walker, E. Edward, Forksville, Va.
Walker, Thos. A., Charlotte, N. C.
Weaver, F. M., Oklahoma City, Okla. Ter.
Weiss, Conrad H., Anacostia, D. C.
Weller, Frank P., Washington, D. C.
Whitehead, Eugene T., Scotland Neck, N.C.
Woodworth, Chas. B., Fort Wayne, Ind.
Wright, Frank C., Cave Spring, Ga.
Yarnold, Edwin, Washington, D. C.
Zemp, Wm. R., Camden, S. C.

LIST OF LIFE MEMBERS.

PUBLISHED IN ACCORDANCE WITH RESOLUTIONS OF THE COUNCIL.

SEE PROCEEDINGS, 1888, PAGE 41.

[Names of Life Members under the Old Constitution in *Italics;* under the present By-Laws, in SMALL CAPITALS.]

Abernethy, Maxwell.
BAUER, LOUIS G.
Best, John.
BIROTH, HENRY.
BORING, EDWIN M.
CANDIDUS, PHILIP C.
CANNING, HENRY,
Colton, James B.
COOMBS, CHARLES E.
Crossman, George A.
Cummings, Henry T.
Dearborn, George L.
DIEHL, C. LEWIS.
DOHME, CHAS. E.
DOHME, LOUIS.
Dolber, Thomas.
DRAKE, JOHN R.
DRURY, LINUS D.
Du Puy, Eugene.
EBERT, ALBERT E.
Eckford, Joseph W.
ELLIOTT, HENRY A.
Ellis, Evan T.
FOUGERA, EDMUND C. H.
FULLER, OLIVER F.
Gale, Edwin O.
Gale, William H.
GEORGE, CHAS. T.
Goodwin, Wm. W.
Gordon, Wm. J. M.
GROSSKLAUS, JOHN F.
HANCE, EDWARD H.
HANCOCK, JOHN F.
HARLOW, NOAH S.
Harrington, Frank.
Haviland, Henry.
Heintzelman, Joseph A.
Heyl, James B.
HOLMES, CLAY W.
HOLZHAUER, CHARLES.
JACQUES, GEORGE W.
Jenks, Wm. F.
Jesson, Jacob.
Kent, Robert R.
KING, JAMES T.
KLUSSMAN, HERMANN.
LAND, ROBERT H.
LEE, JAMES A.
LEMBERGER, JOSEPH L.
LEWELLYN, JOHN F.
LLOYD, JOHN URI.
Mellor, Alfred.
MEYER, CHRISTIAN F. G.
MILHAU, EDWARD L.
MILLER, ADOLPHUS W.
Moffit, Thomas S.
Moith, Augustus T.
Molwitz, Ernest.
MOORE, GEORGE.
MOORE, JOACHIM B.
Ollif, James H.
ORNE, JOEL S.
OWENS, RICHARD J.
Patten, I. Bartlett.
Peabody, Wm. H.
Perot, T. Morris.
PETITT, HENRY M.
PFINGST, FERDINAND J.
PORTER, HENRY C.
POWER, FREDERICK B.
Rano, Charles O.
RAMSPERGER, GUSTAVUS.
REMINGTON, JOSEPH P.
Rittenhouse, Henry N.
ROBINSON, JAMES S.
Rollins, John F.

Sander, Enno.
Saunders, William.
Scheffer, Henry W.
Seabury, George J.
Sharp, Alpheus P.
Sheppard, Samuel A. D.
Shinn, James T.
Simms, Giles G. C.
Sloan, George W.
Snyder, Ambrose G.
Stacey, Benjamin F.
Steele, James G.
Sweeney, Robert O.
Thompson, William B.
Vernor, James.
Viallon, Paul L.
Warner, Wm. R.
Waugh, George J.
Wellcome, Henry S.
Whitfield, Thomas.
Whitney, Henry M.
Wiegand, Thomas S.
Wilson, Benjamin O.
Winkelmann, John H.
Winter, Jonas.
Woltersdorf, Louis.
Yorston, Matthew M.

Note.—Names of life members whose residence has been unknown for five consecutive years, are no longer published in the above list, in accordance with the action of the Council approved at the forty-eighth annual meeting. (See Proceedings 1900, p. 18.)

GENERAL INCORPORATION LAW FOR THE DISTRICT OF COLUMBIA.

Sections Applicable to the American Pharmaceutical Association.

Class 3, Societies, Benevolent, Educational, etc.

Sec. 545. Any three or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts, may make, sign, and acknowledge before any officer authorized to take acknowledgment of deeds in the District, and file in the office of the Recorder of Deeds, to be recorded by him, a certificate in writing, in which shall be stated:

First. The name or title by which such society shall be known in law.

Second. The term for which it is organized, not exceeding twenty years.

Third. The particular business and object of the society.

Fourth. The number of its trustees, directors, or managers for the first year of its existence.

Sec. 546. Upon filing their certificate, the persons who shall have signed and acknowledged the same, and their associates and successors, shall be a body politic and corporate, by the name stated in such certificate; and by that name they and their successors may have and use a common seal, and may alter and change the same at pleasure, and may make by-laws and elect officers and agents; and may take, receive, hold and convey real and personal estate necessary for the purposes of the society as stated in their certificate.

Sec. 547. Such incorporated society may annually, or oftener, elect from its members its trustees, directors, or managers, at such time and place, and in such manner as may be specified in its by-laws, who shall have the control and management of the affairs and funds of the society, and a majority of whom shall be a quorum for the transaction of business; and whenever any vacancy shall happen among such trustees, directors, or managers, the vacancy shall be filled in such manner as shall be provided by the by-laws of the society.

Sec. 548. The trustees, directors, or stockholders of any existing benevolent, charitable, educational, musical, literary, scientific, religious, or missionary corporation, including societies formed for mutual improvement, may, by conforming to the requirements herein, re-incorporate themselves, or continue their existing corporate powers under this chapter, or may change their name, stating in their certificate the original name of such corporation as well as their new name assumed; and all the property and effects of such existing corporation shall vest in and belong to the corporation so re-incorporated or continued.

Sec. 549. Such corporations may sell and dispose of any real estate they may acquire by purchase, gift, or devise, as follows: whenever any lot purchased for the use of the corporation, or any building erected thereon, shall become ineligible for the uses for which the lot was purchased or the building erected, to be determined by a vote of two-thirds of the shares of the stock of the corporation or the members of the corporation, at a meeting of the stockholders, or corporators, or members specially called for that purpose, the proceedings of which meeting shall be duly entered in the records of the

corporation; said lot or building may be sold, and the proceeds thereof may be vested in another lot, or in the erection of another building, or both.

SEC. 550. When any real estate shall have been devised or given to any such corporation for any specified benevolent purpose, and where, by a vote of three-fourths of the stock held by the stockholders, or three-fourths of the corporators, if no shares of stock have been created, at a meeting called for the purpose, of which such stockholders or corporators or members shall have at least ten days' notice, the corporation shall determine to surrender their corporate powers and cease to act under the same, said real and personal estate so acquired shall be sold at public auction, proper notice of the time and place of sale having been given, and the proceeds of the sale equitably distributed among the stockholders or corporators, or disposed of for the promotion and advancement of the objects for which such corporation was originally organized.

SEC. 551. No corporation acting under the six preceding sections shall hold real estate more than five years, except so much as shall be necessary for the purposes named in its certificate.

SEC. 552. The provisions of this chapter shall not extend or apply to any association or individual who shall, in the certificate filed with the Recorder of Deeds, use or specify a name or style the same as that of any previously existing incorporated body in the District.

Approved 5 May, 1870, c. 80, v. 16, pp. 98–116—Revised Statutes of the United States, relating to the District of Columbia.

CERTIFICATE OF INCORPORATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Whereas, we, the undersigned, desire to form an association having for its object to unite the educated and reputable Pharmacists and Druggists of America, as will more fully hereinafter appear;

Now, therefore, we do hereby certify as follows:

First, The corporate name of the association is the American Pharmaceutical Association.

Second, This association shall continue until dissolved by the action of its members, or by the operation of law.

Third, The objects and business of said Association are as follows:

a. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulterations.

b. To encourage proper relations between Druggists, Pharmacists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

c. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and in encouraging home production and manufacture in the several departments of the drug business.

d. To regulate the system of apprenticeship and employment, so as to prevent, so far as possible, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

e. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

f. To uphold standards of authority in the education, theory and practice of Pharmacy.

g. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and the greatest protection to the public.

Fourth. The concerns and affairs of the Association shall be managed by a Council, which shall consist for the first year of John U. Lloyd, Maurice W. Alexander, Alexander K. Finlay, Karl Simmon, Samuel A. D. Sheppard, John M. Maisch, James Vernor, C. Lewis Diehl, William H. Rogers, William Saunders, Albert E. Ebert, Philip C. Candidus, George W. Kennedy, Albert H. Hollister, James M. Good, Lewis C. Hopp and William Dupont.

Given under our respective hands and seals this 12th day of December, A. D. 1887.

Signed: JOHN U. LLOYD, MAURICE W. ALEXANDER, ALEX. K. FINLAY, KARL SIMMON, SAMUEL A. D. SHEPPARD, JOHN M. MAISCH, JAMES VERNOR, C. LEWIS DIEHL, WILLIAM H. ROGERS, WM. SAUNDERS, ALBERT E. EBERT, PHILIP C. CANDIDUS, GEORGE W. KENNEDY, ALBERT H. HOLLISTER, JAMES M. GOOD, LEWIS C. HOPP, WILLIAM DUPONT,

Members of the Council, And JOHN A. MILBURN, G. G. C. SIMMS, E. B. BURY, Z. W. CROMWELL, W. S. THOMPSON, JOHN R. MAJOR, CHARLES CHRISTIANI, W. G. DUCKETT, A. J. SCHAFHIRT, GEO. W. BOYD, O. H. COUMBE, HENRY A. JOHNSTON, GEO. B. LOCKHART, W. C. MILBURN, T. C. MURRAY, ARTHUR NATTANS, JOSEPH R. WALTON, THOMAS M. WEHRLY,

of the District of Columbia.

(Notaries' certificates attached to the original document attest the genuineness of each and every signature.)

Received for Record February 21st, 1888, at 1:05 P. M., and recorded in Liber No. 4, fol. 302, Acts of Incorporation, District of Columbia, and examined.

Signed: JAMES M. TROTTER, *Recorder.*

SEAL: Office of Recorder of Deeds, District of Columbia, Washington, D. C.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians, and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving he votes of three-fourths of the members present, it shall become a part of this Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS.

CHAPTER I.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary of $1000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays, and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report of the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act. He shall notify every member at least two weeks in advance of the time and place of each annual meeting.

CHAPTER III.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER IV.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary of $750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of $5,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or a Trust Company acceptable to the Council.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary of $750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such statistical and biographical notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting, unless such meeting is held previous to August 1. An introduction or synopsis of the Report to be presented to the Section on Scientific Papers.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of twenty-two members, nine of whom, selected from such members as have had at least three years' membership in this Asso-

ciation, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. None but *ex-officio* members of the Council shall be eligible for re-election thereto until one year after the expiration of their term of office.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, the Chairmen of the Sections of the Association, and the Secretary of the Council, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears, one copy of the annual Report of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sessions of the Association and of the Sections, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as it may deem worthy of insertion. It shall also fix the price at which the Proceedings may be sold.

CHAPTER VII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany, who may be especially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of the Constitution and By-laws, subscribe to them, are eligible to membership; provided that no one, whose name has been dropped from the roll for non-payment of dues, shall be eligible for membership until payment has been made of the three years' dues for which he is in arrears.

ARTICLE II. Any two members of the Association may propose to the Council the name of any person eligible to membership, and if approved, the Council shall recommend the person named to the Association, and post the name in some suitable place in the meeting hall, near the beginning of a session: objection, if any, to be made in writing, to the Secretary of the Council, previous to the Association taking any action on the proposition. Near the close of the same, or at a subsequent session, the Association may, by vote, elect such person a member, after which his membership shall be completed by his signing the Constitution and By-Laws, and paying the annual dues for the current year.

ARTICLE III. Every member shall pay in advance to the Treasurer the sum of *Five Dollars* as his yearly contribution, and by neglecting to pay said contribution for *three successive years* he may be dropped from the Roll.

ARTICLE IV. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $75 during the first year of his connection therewith, or after five years $70, or after ten years $60, or after fifteen years $50, or after twenty years $40, or after twenty-five years $30, or after thirty years $20, or after thirty-five years $10, also any member who shall have paid to the Treasurer annual dues for thirty-seven years, shall become a life member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials shall be sent to the General Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER VIII.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, four Sections shall be formed, as follows: 1. Section on Scientific Papers: 2. Section on Commercial Interests; 3. Section on Practical Pharmacy and Dispensing; 4. Section on Pharmaceutical Legislation and Education.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. At the third session the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. The fourth session shall be devoted to the subject of Practical Pharmacy and Dispensing.

ARTICLE VII. The fifth, sixth and seventh sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

ARTICLE VIII. At the eighth and ninth sessions the Section on Pharmaceutical Legislation and Education shall consider the business assigned to that Section.

ARTICLE IX. A Chairman and a Secretary shall be elected by ballot by each Section to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE X. The Chairman of each Section shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the annual meeting.

ARTICLE XI. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging

in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XII. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, synopsis or in full, and laid on the table for future consideration.

Section 6. The President shall call the roll of States, the Territories, District of Columbia and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association at large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

Section 7. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, its acts shall be revised, so as to be acceptable to the Association.

Section 8. A committee of five on time and place of meeting shall be appointed by the President at the first session, to report at the second session.

Section 9. Incidental business.

ARTICLE XIII. The order of business at the second general session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The Report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the persons nominated shall be balloted for.

Section 4. Reading of the Minutes of the Council.

Section 5. The Council shall present names of persons recommended for membership.

Section 6. Reading of the Reports of the Treasurer and General Secretary.

Section 7. Reports of Standing Committees shall be read.

Section 8. Reports of Special Committees shall be read.

Section 9. Incidental business.

ARTICLE XIV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVI. At the last general session of the Association the newly-elected officers of the Association shall take their respective places.

ARTICLE XVII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER IX.

Of Committees.

ARTICLE I. There shall be appointed or elected eight Standing Committees as follows: a Committee on Commercial Interests, a Committee on the Revision of the Pharmacopœia, a Committee on Practical Pharmacy and Dispensing, and a Committee on Pharmaceutical Legislation and Education, each to consist of five members; a Committee on Scientific Papers, a Committee on the Ebert Prize, a Committee on General Prizes, each to consist of three members; and a Committee on Transportation, to consist of ten members.

ARTICLE II. The Committee on Commercial Interests shall be elected by the Section on Commercial Interests. It shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. It shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be elected by the Section on Scientific Papers. It shall arrange the business of the Section, and shall report a number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person preparing a paper for the Association which will require more than ten minutes for its reading, must accompany the same with a synopsis which can be read within ten minutes' time. The paper and synopsis must both be furnished the Committee of the particular Section to which it refers, previous to the first session.

ARTICLE V. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, within six months after the annual meeting at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE VI. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE VII. The Committee on Practical Pharmacy and Dispensing shall be elected by the Section on Practical Pharmacy and Dispensing. It shall arrange in advance the business to come before the Section at the next annual meeting. It shall propose a series of subjects for general discussion, and solicit papers on subjects pertaining to the actual practice of pharmacy in retail stores.

ARTICLE VIII. The Committee on Pharmaceutical Legislation and Education, which shall be elected by the Section on Pharmaceutical Legislation and Education, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. It shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year. It shall arrange the business of the Section in advance of its sessions, propose

suitable subjects for discussion, and shall attend to such duties as may be delegated to it by the Section. It shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE IX. The Committee on Revision of the United States Pharmacopœia shall be appointed by the President of the Association. It shall collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia, so as to facilitate and aid the work of the National Committee on Revision of the U. S. P.

ARTICLE X. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

CHAPTER X.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER XI.

Miscellaneous.

ARTICLE I. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-Laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

ARTICLE III. No one or more of these By-Laws shall be suspended.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary of $150.

ARTICLE II. He shall post in a conspicuous place in the meeting-room the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

CHAPTER IV.

Of Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of seven members of the Council, to be elected annually by ballot. The General Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect its chairman immediately after the election of its members by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present to the Council the list of applicants for membership who have complied with the requirements of the By-Laws of the Association.

ARTICLE III. It shall furnish appropriate biographical sketches of deceased members for publication in the Report of the Proceedings.

ARTICLE IV. The Secretary of the Committee shall receive an annual salary of $150.

CHAPTER V.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council. Immediately after its election by the Council, the Committee shall elect a Chairman.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Report of the Proceedings.

CHAPTER VI.

Of Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members, who shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and the Secretary.
2. Election of the Standing Committees of Council, as follows:

a. Committee on Membership, consisting of seven members of the Council, the General Secretary and the Treasurer.

b. Committee on Finance, three members.

c. Committee on Publication, five members.

d. Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

SECTION ON COMMERCIAL INTERESTS.

ORDER OF BUSINESS.

1. Calling the Section to Order.
2. Reading of the Chairman's Address.
3. Reports of Committees.
4. Reading of Papers.
5. New Business and Discussion.
6. Nomination and Election of Officers for the ensuing year.
7. Installation of Officers.
8. Reading of the Minutes.
9. Adjournment.

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

ORDER OF BUSINESS.

1. Calling the Section to Order.
2. Reading of the Chairman's Address.
3. Reports of Committees.
4. Discussions.
5. Reading of Papers.
6. Nomination and Election of Officers.
7. Installation of Officers.
8. Incidental Business.
9. Reading of the Minutes.
10. Adjournment.

SECTION ON SCIENTIFIC PAPERS.

ORDER OF BUSINESS.

First Session of the Section.

1. Calling the Section to Order.
2. Reading of the Chairman's Address.
3. Reports of Committees, if there be any to make, and appointment of such new Committees as may appear desirable.
4. Nominations (but not elections at this sitting) for the new officers of the Section. The names of members nominated to be posted in the hall on the adjournment of this session. The election not to take place until after the opening of the next session, when further nominations may also be made if it is deemed desirable.
5. Reading of Papers and discussions on the subjects brought up.
6. Adjournment.

Second Session of the Section.

1. Reading of Minutes of the previous session.
2. Election of Officers for the ensuing year.
3. Reports of Committees—Incidental Business.
4. Reading of Papers and Discussion.
5. Adjournment.

Third Session of the Section.

1. Reading of Minutes of the previous Session.
2. Reading of Papers and Discussion.
3. Reports of Committees.
4. Installation of Officers.
5. New Business.
6. Reading of Minutes.
7. Final Adjournment.

SECTION ON EDUCATION AND LEGISLATION.

ORDER OF BUSINESS.

First Session of the Section.

1. Calling the Section to Order.
2. Reading of the Address of the Chairman.
3. Report of the Secretary.
4. Reports of Committees.
5. Nominations of Officers for the ensuing year. The election to take place at the opening of the second session.
6. Reading of Papers and Discussion.
7. Adjournment.

Second Session of the Section.

1. Reading of Minutes of the previous session.
2. Election of Officers for the ensuing year.
3. Reports of Committees.
4. Reading of Papers and Discussion.
5. New Business.
6. Installation of Officers.
7. Reading of Minutes.
8. Final Adjournment.

GENERAL RULES OF FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888, 1895, 1900.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

Sixth, There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, the Chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Auditing Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council, in the presence of another member of the Association, shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, saving-bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Tenth, There shall be a meeting of the Auditing Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

Eleventh, The expense of the bond of the Treasurer, given by a Trust Company, shall be paid for from the Treasury.

Twelfth, The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

Thirteenth, The Finance Committee shall each year, previous to June 1st, present to the Council for its consideration a list of appropriations to cover the various expenditures of the coming fiscal year, the total of such appropriations to be based on the probable amount to be received from the annual dues for the coming year. No payment shall be made in excess of said appropriation except by special vote of the Council.

Fourteenth, Whenever in the judgment of the Finance Committee it shall be necessary, they shall send a written order to the Treasurer, signed by at least two members of said Committee, directing him to use the whole or a portion of the interest of the Life Membership Fund for the current year to defray the expenses of the Association.

FORM OF APPLICATION FOR MEMBERSHIP.

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-laws, I hereby signify my approval of the same, and subscribe to them. I also enclose the annual contribution, five dollars, for the first year of my membership.

Name in full.....

Number and Street.....

Town and State.....

Recommended by the undersigned two members in good standing:

.....

.....

FORMS OF PROPOSITIONS AND OF COMPLETING MEMBERSHIP IN ACCORDANCE WITH CHAPTER VII., ARTICLE II., OF THE BY-LAWS.

THE undersigned members in good standing, being personally acquainted with the following persons eligible to membership in accordance with Chapter VII., Article II. of the By-Laws, testify to their moral character, their skill as practical druggists and pharmacists, and their professional probity and good standing, and they recommend them for membership in the American Pharmaceutical Association.

NAMES OF CANDIDATES. ADDRESS.

Proposed by.....

.....

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-Laws, I hereby signify my approval of the same, and subscribe to them, and enclose the annual contribution, five dollars, for the current year.

Name in full.....

Date.....

Address.....

.....

To be sent to Geo. W. Kennedy, Secretary of the Committee on Membership Am. Ph. Assoc. Pottsville, Penn.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

ENGLAND.

Dr. John Attfield, F. R. S., *Watford*, 1871.
Michael Carteighe, F. I. C., *London*, 1882.
Joseph Ince, F. L. S., *London*, 1882.
Wm. Martindale, F. L. S., F. C. S., *London*, 1898.
E. M. Holmes, F. L. S., *London*, 1899.

GERMANY.

Dr. Edward Schaer, *Strassburg*, 1877.
Dr. Frederick Hoffman, *Berlin*, 1898.
Dr. Carl Schacht, *Berlin*, 1882.
Dr. Ernst Schmidt, Geh. Reg. Rath., *Marburg*, 1899.

INDIA.

David Hooper, F. I. C., F. C. S., *Calcutta*, 1899.

RUSSIA.

Johannes von Martenson, Staatsrath, *St. Petersburg*, 1882.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in SMALL CAPS. Names of Life Members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA.

Anniston.

Wikle, Jesse Lane.....1898

Auburn.

Miller, Emerson Romeo.....1895

Mobile.

Brown, Albert Edward.....1887
CANDIDUS, PHILIP CHARLES.....1857
La Grange, John Van Nuys.....1897
Punch, William Francis.....1874

Montgomery.

Barnett, Joel Jones.....1899
Brigham, Laurence Stanton.....1898
Knabe, Gustavus Alexander.....1876

Tuscaloosa.

Bingham, William Ellison.....1898

ARIZONA.

Prescott.

Brisley, Harry.....1894

ARKANSAS.

Batesville.

Fletcher, John Wade.....1894
Kerr, William Whitman.....1887

Camden.

Morgan, Aylmer Lee.....1890

Diamond P. O.

Laird, John.....1895

Fort Smith.

Sparks, James Mitchell.....1894

Helena.

King, Robert Bruce.....1896

Hot Springs.

Klein, Ernest Frederick.....1894

Little Rock.

Bond, John Barnitz.....1883

Pine Bluff.

Dewoody, William Lawrence.....1887

Pocahontas.

Skinner, William Henry.....1894

Searcy.

Robertson, Felix Otey.....1890

CALIFORNIA.

Benicia Barracks.

Miller, Herman.....1897

Centreville, Alameda Co.

Lernhart, August.....1889

Los Angeles.

Kirkland, Derwentwater.....1889

Napa.

Levinson, Joseph.....1895

Ontario.

Jesson, Jacob.....1872

San Francisco.

Argenti, Jerome John Baptiste.....1893
Barbat, Josephine Eugenia.....1900
Bayly, Charles Alfred.....1889
Dawson, John Henry.....1882

Esters von Krakau, James Henry William 1897
Jackson, William John 1900
Joy, Edwin Wolcott 1882
Moffit, Thomas Sebatier 1861
Pearman, William Edgar 1898
Pearson, Joseph Frederick 1897
Schmidt, Valentine 1887
Searby, William Martin 1882
Stange, Carl Frederick 1897
STEELE, JAMES GURDEN 1859
Weihe, Otto Albert 1893
Wenzell, William Theodore 1870
White, Richard Edward 1889

Santa Clara.

Oberdeener, Samuel 1889

Santa Monica.

Devine, John 1887

Vallejo. Solano Co.

Topley, James 1869

COLORADO.

Boulder.

Ramaley, Francis 1897

Central City.

Best, John 1866
Davies, Llewellyn Powell 1891

Colorado Springs.

Ward, Augustus Jae 1893

Cripple Creek.

Beitenman, William Wallace 1888

Denver.

Depeyre, Louis Nolēl 1894
Ford, Charles Mangan 1887
Hover, William Adgate 1895
Lord, Frank Jotham 1889
Steinhauer, Frederick 1881
Walbrach, Arthur 1881

Leadville.

Taylor, George Edward 1895

Longmont.

Turrell, Judson Wade 1893

COLUMBIA, DISTRICT OF.

Anacostia.

Weiss, Conrad Henry 1900

Washington.

Boyd, George Washington 1883
Bradbury, Wymond Henry 1895
Criswell, Francis McClure 1892
Duckett, Walter G. 1876
Easterday, Herbert Clifton 1893
Elliott, Charles Houston 1899
Eppley, James Kerr 1895
Ewell, Ervin Edgar 1898
Field, William Carlin 1898
Flemer, Lewis 1895
Franzoni, Joseph Dunbar 1900
Gross, Charles Ernest 1900
Hammar, Alrik 1897
Harper, Robert Newton 1900
Henry, Charles Landon 1893
Henry, Frank Clinton 1894
Herbst, William Parker 1895
Hilton, Samuel Louis 1890
Hurlebaus, George William 1895
Hutton, Harry Dubant 1891
Johnston, Henry Augustus 1883
Kulp, Chas. Augustus 1898
Major, John Richards 1873
Martin, John Charles 1883
May, Edward 1897
Milligan, John Dean 1900
Mulcahy, Daniel Domnick 1895
Neely, Guy Minick 1900
Richardson, Willard Stowell 1900
Roe, William Grant 1900
Schafhirt, Adolph Julian 1876
SIMMS, GILES GREEN CRAYCROFT 1860
Stott, Samuel Thompson 1900
Taylor, Augustus Carrier 1900
Thompson, William Scott 1871
Waldner, Paul Jacob 1900
Weller, Franklin Pierce 1900
Varnold, Edwin 1900

CONNECTICUT.

Bridgeport.

Fisher, Elbert Ellsworth 1892
Leverty, John Augustine 1900

Danbury.

Dickinson, Arthur Lyman 1900

Hartford.

Bennett, James Nixon 1900
Cone, John Wright 1876
Edwards, Frederick Bulkeley 1894

Ives, Orvin Francis....1900
Kimball, Richard Hitchens....1900
Newton, Philo Woodhouse....1892
Rapelye, Charles Andrew....1876
Seinsoth, John Jacob....1900
Shannon, Thomas Ross Alvin....1892
Stoughton, Dwight George....1890
Tracy, David Wallace....1892
Williams, John Kirby....1875

Jewett City.

Chabot, David Pierre....1895

Meriden.

Mosher, William Wooster....1894

Middletown.

Pitt, John Richard....1872

Naugatuck.

May, James Oscar....1875

New Haven.

Dimock, Robert Hemphill....1889
Eagny, James Thomas....1894
Gessner, Emil Adolph....1878
Hogan, John Joseph....1890
Lowe, John William....1898
Mix, Willis Lee....1896
Spalding, Warren Alphonso....1876
Sperry, Herman Jay....1880
Wood, Alonzo Felton, Jr....1890
Wood, James Prior....1890

New London.

Nicholas, John Cutter....1886

Norwich.

Duggan, James....1894
Sevin, Nathan Douglas....1875

Putnam.

Dresser, George Edward....1886

Stamford.

Finch, Charles Smith....1900

Thompsonville, Hartford Co.

Smith, Edward Newton....1885
Steele, George Robert....1892

Waterbury.

Perkins, Charles William....1892
Woodruff, Roderick Samuel....1876

Willimantic.

Wilson, Frank Milton....1883

DELAWARE.

Wilmington.

Watson, Herbert Kennedy....1888

FLORIDA.

De Land.

Fisher, George Washington....1893

Jacksonville.

Crum, John Darius....1892
Kirk, James Edgar....1896

St. Augustine.

Smith, Lauriston Stephen....1892
Woodman, Walter Irving....1893

Titusville, Brevard Co.

Dixon, John Marion....1894

Warrington.

Grossjohann, Ernst....1900
Waggener, Richard....1899

GEORGIA.

Atlanta.

Cronheim, Solomon....1892
Dunwody, Richard Gaillard....1891
Jacobs, Joseph....1894
Payne, George Frederick....1893
Watson, Sidney Powell....1887

Augusta.

Durban, Sebastian Charles....1883
LAND, ROBERT HENRY....1859

Bowdon.

Lovvorn, James Lewis....1897

Brunswick.

Joerger, Frederick....1899

Cave Springs.

Wright, Frank C....1900

Greenville.

Tigner, James Ogletree....1890

La Grange.

Slack, Henry Richmond....1890

Macon.

Brunner, Norman Isaac....1878
Cheatham, Thomas Alexander....1890
King, Campbell Thomas....1897
Lamar, Henry James....1897

Morris, Max 1898
Taylor, Mallory Hunt 1898

Rome.

Curry, David W. 1894

Savannah.

Kolb, William Walter 1897
Rowlinski, Robert Antone 1892
Solomons, Isaiah Abram 1894

Summerville.

Arrington, Homer Houston 1892

Thomasville.

Thomas, Robert, Jr. 1888

Waycross.

Paine, Charles Joshua 1899

IDAHO.

Emmett.

Smithson, David Elmer 1890

ILLINOIS.

Aurora.

Staudt, Louis Carl 1890

Cairo.

Schuh, Paul Gustav 1894
Woods, Charles Henry Albert 1897

Camp Point, Adams Co.

Bartells, George Case 1881

Carlinsville, Macoupin Co.

Loehr, Theodore Christian 1888

Chicago.

Adamick, Gustave Hattenhauer 1891
Bartlett, Nicholas Gray 1864
Baur, Jacob 1879
Behrens, Emil Christian Louis 1893
Behrens, Paul Johannes Heinrich 1888
BIROTH, HENRY 1865
Bishop, Samuel Edward 1890
Button, Charles Edwin 1881
Conrad, John 1887
Day, William Baker 1895
EBERT, ALBERT ETHELBERT 1864
Fischer, Oscar Frederick 1892
Frerkson, Richard Christopher 1888
FULLER, OLIVER FRANKLIN 1869
Gale, Edwin Oscar 1857
Gale, William Henry 1857
Grassly, Charles William 1884
Gray, William 1892
Hallberg, Carl Swante Nicanor 1879
Hartwig, Otto Julius 1892
Hereth, Franklin Samuel 1893
Klein, Frederick 1893
Lehman, Louis 1895
Lord, Thomas 1882
Lundberg, John Christian 1892
Matthews, Charles Edwards 1893
McConnell, Charles Henry 1899
McMonies, Thomas Little 1897
Miner, Maurice Ashbel 1880
Oldberg, Oscar 1873
Parsons, John 1865
Patterson, Theodore Henry 1869
Pattison, George Henry 1893
Porter, Millet Nathan 1892
Puckner, William August 1888
Rhode, Rudolph Ernest 1887
Sargent, Ezekiel Herbert 1864
Scherer, Andrew 1884
Schmidt, Florian Charles 1882
Schmidt, Frederick Michael 1887
Schmidt, Oscar Weber 1899
Schneider, Albert 1899
Sempill, Walter Morrison 1892
Truax, Charles 1882
WHITFIELD, THOMAS 1865
WOLTERSDORF, LOUIS 1865
Wooten, Thomas Victor 1893

Chicago Heights.

Michalek, John 1900

East St. Louis.

Knoebel, Thomas 1892

Geneseo.

Stamm, Dante Milton 1896

Highland.

Mueller, Adolphus 1871

Kankakee.

Rogers, Henry Horace 1895

Metropolis.

Humma, Henry John 1900

Moline.

Lindvall, Charles Gustaf 1897
Sohrbeck, George Henry 1888
Sohrbeck, George William 1897

Mount Vernon.

Morse, Edward Worth.....1896

North Alton.

Barth, George Fred.....1896

Ottawa.

Higby, William Herbert.....1892

Pekin.

Ehrlicher, Henry Michael.....1892

Peoria.

Benton, Wilber Merritt.....1888
Heschong, John Frederick.....1896
Lueder, Fritz.....1894
Vonachen, Frank Herman.....1895
Zimmermann, Albert.....1893

Pontiac.

Murphy, John Spence.....1896

Quincy.

Koch, John Adolph.....1896

Stronghurst, Henderson Co.

Harter, Isaac Foster.....1893

INDIANA.

Columbus.

Otto, Theodor G. E.....1900
Stahlhuth, Ernst Henry William.....1887

Evansville.

Schlaepfer, Henry John.....1879

Fort Wayne.

Woodworth, Charles Beecher.....1900

Garrett.

Stoehr, Julius John.....1894

Indianapolis.

Carter, Frank Henry.....1891
Dill, Josiah Byron.....1878
Eads, Robert Isom.....1895
Eichrodt, Charles William.....1892
Field, Claud.....1890
Frauer, Herman Emanuel.....1881
Huder, Henry J.....1894
Hurty, John Newell.....1882
Lilly, Josiah Kirby.....1890
Sloan, George White.....1857
Waddell, Minor T.....1899
Walter, Charles Albert.....1899

Jeffersonville.

Loomis, John Clarence.....1876

Lafayette.

Glick, Harry Edwin.....1900

La Porte.

Meissner, Frederick William, Jr.....1890

New Albany.

Crecelius, Charles Edgar.....1900
Knoefel, Bruno.....1896
Knoefel, Charles Deitrick.....1894

South Bend.

Eliel, Leo.....1882
Meyer, Martin Monroe.....1897

Union City.

Sprowl, George Melburne.....1898

Warren.

Hickerson, William Henry.....1894

IOWA.

Akron.

Mead, Nehemiah Paul.....1899

Charles City.

Legel, John Gotthelf.....1897

Clear Lake.

Etzel, John Leonhardt.....1897

Clinton.

Major, Oscar.....1880

Davenport.

Ballard, John Winthrop.....1871

Des Moines.

Howard, Fletcher.....1895
Macy, Sherman Rtley.....1891

Dubuque.

Torbert, Willard Horatio.....1887
Wittmer, Joseph Washington, Jr.....1896

Fort Dodge.

Oleson, Olaf Martin.....1877

Fort Madison.

Schafer, George Henry.....1871

Iowa City.

Boerner, Emil Louis.....1877

Keokuk.

Kiedaisch, John Frederick, Jr.....1893

Mason City.

Burns, Edwin Miller 1897

Muscatine.

Braunwarth, Alice Louisa.....1892

Oskaloosa.

Pickett, John Harvey ... .1887

Sioux City.

Arnold, Charles Frederick ... .1891
Moore, Silas Harwood.....1880
Scherling, Gustav..... 1884

Stuart.

Treat, Joseph Augustus..... : 1885

Waterloo.

Wangler, Conrad David 1876

KANSAS.

Argentine.

McGeorge, William 1895

Gypsum City, Saline Co.

Schmitter, Jonathan.....1892

Hutchinson.

Ardery, Lorimer 1895

Lawrence.

Havenhill, L. D... 1900
Leis, George.....1869
Moore, John Thomas 1888
Sayre, Lucius Elmer 1883

Leavenworth.

Mehl, Henry William.....1892

Ottawa.

Becker, Charles Lewis..... 1892

Topeka.

Holliday, Francis Emlen.....1900
Merrell, Ashbel Hill.....1884

Wilmore.

Sombart, John Edward..... ...1881

KENTUCKY.

Covington.

Belt, James Ferris 1892
Pieck, Edward Ludwig 1887
Zwick, Karl George.....1899

Flemingsburg.

Reynolds, John Jefferson 1876

Frankfort.

Averill, William Henry.....1874
Gayle, John William 1891

Louisville.

Bell, Emil Remigius 1899
Curry, Gordon Laten 1900
Diehl, Conrad Lewis 1863
Dilly, Oscar Charles 1888
Dimmitt, Addison 1895
Jones, Simon Newton 1870
Newman, George Abner.....1866
O'Gorman, Theophilus Vincent.....1897
Peter, Minor Cary 1894
Pfingst, Ferdinand John.....1867
Schiemann, Edward Bernard..... ..1880
Schoettlin, Albert John 1882
Snyder, Robert Johnson.....1887
Thieman, John Henry, Jr.....1896
Troxler, Constantine, Jr..... 1896
Votteler, William..... 1895

Shelbyville.

Preissler, Henry Webber.....1893

Somerset.

Porter, Chilton Scott..... 1882

LOUISIANA.

Bayou Goula.

Viallon, Paul Louis.....1870

Hammond.

Brewer, John Weems.....1893

New Iberia.

Lee, James Augustin.....1856

New Orleans.

Brown, George Stewart.....1900
Finlay, Alexander Kirkwood.....1883
Godbold, Fabius Chapman.....1887
Grambois, Augustin.....1891
Keppler, Christian Lewis.....1882
Legendre, Joseph Amilcar.....1891
Levy, William Michael.....1894
Lyons, Isaac Luria... 1875
May, Eugene.....1891
Metz, Abraham Lewis.....1887

Otto, John Nicholas Washington.....1891
Quayle, Thomas Andrew..... 1897
Samson, Max.....1900
Taylor, Walter Thomas.....1891
Wunderlich, Edward.....1891

Plaquemine.

Hiriart, Sebastian..... 1891

Port Allen.

Charroppin, Emile Lafond..... ...1891

MAINE.

Auburn.

Robinson, William Allen.....1892

Augusta.

Partridge, Charles Kimball.....1867
Partridge, Frank Reuben.....1895

Bangor.

Harlow, Noah Sparhawk.....1859
Sweet, Caldwell. 1881

Bath.

Anderson, Samuel 1876

Biddeford.

Boynton, Herschel.....1875

Boothbay Harbor.

McClearn, Henry Trefethen.....1896

Kittery.

Trefethen, Frederick James.....1899

Lewiston.

Lowell, Edward Mark.....1896
Moulton, Daniel Pierce.....1891

Machias.

Crane, Frank Trussell 1894

Orono.

Jackman, Wilbur Fisk.....1899

Pittsfield.

Libby, Henry Fitzgerald..... 1882

Portland.

Broe, James Augustine.....1898
Drew, Walter Israel.....1896
Frye, George Carlton 1879
Hay, Edward Allston 1889
Perkins, Benjamin Abbott 1878
Schlotterbeck, Augustus George.....1896

Saco.

Sawyer, Charles Henry.....1896

South Windham.

Rand, Daniel Moulton... 1892

Waterville.

Dorr, George Watson.....1896

MARYLAND.

Baltimore.

Appleby, Samuel Norwood.....1899
Base, Daniel.....1898
Baughman, John Henry.....1899
Beck, John Godlove.....1899
Brack, Charles Emil.....1876
Brickman, Arthur Otto.....1898
Burrough, Horace 1883
Caspari, Chas., Jr.....1883
Caspari, William, Jr.....1898
Corning, Albion James 1898
Culbreth, David Marvel Reynolds....1883
Davis, John Alexander.....1894
Dohme, Alfred Robert Louis.....1891
Dohme, Charles Emile.....1863
Dohme, Charles Louis.....1899
Dohme, Louis.....1859
Elliott, Henry Alexander 1859
Emich, Columbus Valentine 1863
Fouch, William M. 1898
Frames, John Fuller 1890
Gilpin, Henry Brooke.....1889
Gosman, Adam John.....1870
Hall, Robert Edmund Lee.....1898
Hancock, John Francis.....1863
Hengst, J. Edwin 1900
Hynson, Henry Parr.....1890
Jenkins, William Edgar.....1898
Kammer, Daniel Alexander 1898
Kelly, John Ignatius 1898
Kornmann, Henry.... 1899
Lindeman, Harry Frederick.....1898
Maisch, Henry..... 1898
Mansfield, Samuel 1898
Millard, David Rockwell.....1899
Morgan, Charles..... 1899
Muth, George Lewis.....1894
Muth, John Clement 1898
Muth, John Sebastian 1898
Nattans, Arthur.....1883
Nordmann, Herman.....1895
Pennock, Edward.....1898

Pilson, Abram Owen....1898
Quandt, Arthur Albert....1894
Quandt, Ernest Edmund....1894
Richardson, Thomas Leonard....1895
Robinson, Samuel Le Roy....1898
Schrader, August Christian....1898
Schulze, Louis....1892
Sharp, Alpheus Phineas....1855
Simon, William....1885
Smith, Theodric....1890
Streett, Edmund Oldfield....1898
Stuart, William Alexander....1898
Thomas, John Benjamin....1898
Thompson, Albert Eccleston....1898
Vellines, Davies....1895
Ware, Charles Howard....1898
Westcott, James Walling....1890
Wiesel, John Martin....1898
Williamson, Robert Edward Lee....1898
Winkelmann, Henry Christian....1898
WINKELMANN, JOHN HENRY....1864

Cambridge.

DeReeves, Antonio Eugene....1898

Frederick City.

Schley, Steiner....1878

Hagerstown.

Aughinbaugh, David Culbertson....1898
Meredith, Harry Lionel....1900
Mumma, Daniel Edgar....1897
Walts, Charles Conley....1898
WINTER, JONAS....1863

Lonaconing.

Campbell, George Dewery....1900

Snow Hill.

Powell, William Cottingham....1895

Taneytown.

McKinney, Robert Sentman....1898

MASSACHUSETTS.

Boston.

Baird, Julian William....1894
Bassett, Charles Harrison....1867
Boyden, Edward Cleveland....1874
Burnham, Alfred Augustus, Jr....1891
Burwell, Arthur Cyrus....1899
CANNING, HENRY....1865
Capper, William Ernest....1892
Colton, James Byers....1865
COOMBS, CHARLES EVERETT....1897
Cramer, Max....1881
Doliber, Thomas....1859
Douglass, Stephen William....1898
DRURY, LINUS DANA....1871
Durkee, William Carley....1885
Ewing, Mary Steele....1898
French, John Innes....1894
Gammon, Irving Parker....1891
Golding, John Granville....1875
Hayes, James Henry....1892
Hedley, Thomas Albert....1893
Jones, James Taber....1875
Kelley, Edward Samuel....1871
Lauricella, Felice....1896
Lewis, Ernest Grant....1892
Lowd, John Colby....1871
Markoe, George Burger....1897
Patton, Ichabod Bartlett....1858
Pfaff, Franz....1899
Pierce, William Herbert....1879
Sawyer, William Frederick....1885
Scoville, Wilbur Lincoln....1891
Sharples, Stephen Paschell....1875
SHEPPARD, SAMUEL AIRUS DARLINGTON....1865
Smith, Linville Holton....1892
Stowell, Daniel....1875
Tilden, Amos Kendall....1892
Tucker, Greenleaf Robinson....1890
Vargas-Heredia, Jorge....1891
Varney, Edward Francis....1892
Wells, Edwin Herbert....1893
West, Charles Alfred....1892
Wheeler, William Dexter....1892
Williams, George Gorham....1888
WILSON, BENJAMIN OSGOOD....1859
Wood, Edward Stickney....1879

Brockton.

Randall, Frank Otis....1893

Cambridge.

Claflin, Walter Addison....1896
Lynch, Frank Herman....1897
Phillips, Carrie Elizabeth....1894

Cambridgeport.

La Pierre, Elie Henry....1892
Laing, Alfred Allan....1888
Norton, George Edward....1895
ORNE, JOEL STONE....1859

Charlestown.

Marshall, Ernest Clifton.....1875
Stacey, Benjamin Franklin.....1860

Chelsea.

Buck, John Lynian.....1883

Concord.

Richardson, Horatio Stillman.....1892

Fall River.

Riddell, Benjamin Franklin.....1892

Fitchburg.

Estabrook, Henry Arthur.....1886

Holyoke.

Ball, Charles Ely.....1885

Jamaica Plain.

Ernst, Frank Frederick.....1891

Lawrence.

Glover, William Henry.....1891

Lee.

Pease, Francis Merrick.....1880

Leominster.

Nixon, Charles Frederic.....1900

Lowell.

Bailey, Frederick.....1869
Butler, Freeman Hall.....1874
Hood, Charles Ira.....1871
Robinson, Edward Augustus.....1888
Thomasson, Anders.....1892

Malden.

Keaney, James John.....1889

Marlborough.

Hartshorn, Frederick Arthur.....1880

Melrose.

Larrabee, John.....1897

New Bedford.

Blake, James Edwin.....1866
Bunker, Elihu.....1885
Shurtleff, Israel Hammond.....1875

Newburyport.

Davis, Charles Leland.....1897
Goodwin, William W......1853

Newton.

Crowdle, John Edward.....1894
Hudson, Arthur.....1882

North Andover.

Murphy, John P.....1900

North Andover Depot.

Whitney, Henry Martin.....1859

Pittsfield.

Hydren, Carl.....1892
Manning, John Henry.....1889

Raynham.

Crossman, George Alvin.....1872

Salem.

Nichols, Thomas Boyden.....1876
Price, Charles Henry.....1882
Price, Joseph.....1888

Shelburne Falls.

Baker, Edwin.....1875

Stoneham.

Drake, Frederick Townsley.....1894
Patch, Edgar Leonard.....1872
Ward, Charles Abraham.....1891

Worcester.

Guerin, James Francis.....1898
Harris, Francis Mason.....1894
Scott, George Theodore.....1883

MICHIGAN.

Ann Arbor.

Eberbach, Ottmar.....1869
Prescott, Albert Benjamin.....1871
Schlotterbeck, Julius Otto.....1888
Schumacher, Albert Christian.....1900
Stevens, Alviso Burdette.....1885

Armada, Macombe Co.

Philips Edwin Freeman.....1880

Corunna.

Reidy, Michael.....1894

Detroit.

Doty, Wirt Payson.....1900
Du Puy, Eugene.....1852
Hall, William Manson.....1888
Helfman, Joseph.....1894
Houghton, Elijah Mark.....1899
Knox, James Wesley Thompson.....1898
Lyons, Albert Byron.....1885
Mason, Harry Beckwith.....1896
Perry, Frederick William Riley.....1885

Ryan, Frank Gibbs 1892
Seltzer, Leonard Adams 1899
Sherrard, Charles Cornell 1893
Stearns, Frederick 1897
Vernor, James 1866
Warren, William Matthew 1889

Flushing.

Sprague, Wesson Gage 1895

Ionia.

Gundrum, George 1882

Kalamazoo.

McDonald, George 1871
Todd, Albert May 1885

Saginaw.

Heim, Henry 1900

MINNESOTA.

Duluth.

Boyce, Samuel F 1871
Sweeney, Robert Ormsby 1866

Jasper.

Johnson, Louise Loretto (Mrs.) 1898

Minneapolis.

Allen, E. Floyd 1885
Danek, John Francis 1895
Gamble, Stewart 1897
Huhn, Charles Hugo 1897
Huhn, George 1884
King, George Alexander Newton 1892
Lariviere, Telesphore 1896
Peterson, Johannes Otto 1895
Rauch, Henry 1897
Thompson, Albert Delano 1895
Wanous, Josephine Anna 1897
Webster, Hendrick Gordon 1895
Wittich, Matthew Henry 1897
Wulling, Frederick John 1893

Monticello.

Lynch, Robert Fulton 1897

New Ulm.

Eckstein, Andrew Joseph 1895

Ortonville.

Neilson, John 1897

Pelican Rapids, Otter Tail Co.

Axness, Ole Mikkelson 1895

Spring Valley.

Rhode, Claus Frederick 1885

St. Louis Park.

Fink, Frederick William 1886

St. Paul.

Collier, William Kelly 1897
Frost, William Arthur 1892
Getty, Wilmot Stevenson 1896
Heller, Charles Tomkins 1895
Zimmermann, Bernard 1895

Warren.

Whitney, Edgar Francis 1897

Witmar.

Carlson, Swan B 1897

MISSISSIPPI,

Aberdeen, Monroe Co.

Eckford, Joseph William 1883

Meridian.

Moore, Joshua Forrest 1891

Port Gibson.

Shreve, John Alexander 1880

MISSOURI.

Aux Vasse.

Craighead, Gordon Garriet 1895

Boonville.

Mittelbach, William 1891

Carrollton.

Knight, William Christian 1900
PETTIT, HENRY MCEWEN 1860

Excello, Macon Co.

Powell, William David 1898

Freeman.

Dolan, Frank Linley 1888

Jefferson City.

Brandenberger, Adolph 1894

Kansas City.

Crampton, Ferd Leslie 1896
Eyssell, George 1889
Hess, Paul Ludwig 1892
Krueger, Owen William 1897
Walker, David 1894

Kirkwood.

Hemm, Louis Phillips.....1894

Lebanon.

Farrar, Samuel Richard.....1891

Mexico, Audrian Co.

Llewellyn, John Frederick.....1867

Rich Hill.

Youngs, William.....1883

St. Joseph.

Clark, James Ryland.....1895

St. Louis.

Allen, John Hays.....1898
Blank, Alois.....1881
Boehm, Solomon.....1871
Falk, John Charles.....1900
Good, James Michener.....1871
Grandjean, Eugene.....1871
Hassebrock, Henry Fred.....1884
Hemm, Francis.....1881
Hinrichs, Gustavus Detlef.....1895
Kaentner, Frederick William.....1897
Klie, George Henry Charles.....1878
Layton, Thomas.....1892
Mallinckrodt, Edward.....1869
May, Charles Charlotte.....1898
Meyer, Christian Fried. Gottlieb.....1860
Noll, Martin James.....1898
Pauley, Frank Charles.....1879
Sander, Enno.....1858
Scheffer, Henry William.....1863
Schurk, Louis.....1890
Schweikhardt, Richard.....1890
Sennewald, Emil August.....1900
Uhlich, Ferdinand Gottlieb.....1881
Vitt, Rudolph Simon.....1895
Vordick, August Henry.....1874
Walerius, Mathias.....1897
Wall, Otto Augustus.....1884
Westmann, Frank Henry.....1882
Whelpley, Henry Milton.....1887
Whitcomb, Frederick Ezekiel.....1888
Wilson, Charles Frederick.....1891
Wurmb, Theodore Henry.....1890

Webster Groves, St. Louis Co.

Meisburger, William Joseph.....1900
Mueller, Ambrose.....1894

MONTANA.

Butte.

Rockefeller, Howard.....1900

NEBRASKA.

Fairbury.

Pease, Autumn Vine.....1893

Fremont.

Brunner, Charles Henry.....1895

Grand Island, Hall Co.

Buchheit, Augustus William.....1893

Omaha.

Kuhn, Norman, Archibald.....1878
Mares, Ferdinand Louis.....1897
Myers, Preston B.....1897
Schmidt, Joseph H.....1897
Sherman, Charles Rollin.....1889

NEVADA.

Winnemucca.

Brown, William Ambrose.....1893

NEW HAMPSHIRE.

Derry Depot.

Bell, Samuel Howard.....1890

Dover.

Rollins, John Francis.....1859

Groveton.

Wilson, John March.....1897

Littleton.

Robins, Wilbur Fiske.....1892

Manchester.

Baril, Joseph Benjamin.....1892

New Market.

Dearborn, George Luther.....1853

Portsmouth.

Grace, William Day.....1896
Green, Benjamin.....1888
Preston, Andrew Peabody.....1881
Walts, David Yarnall.....1897

Somersworth.

Hurd, John Charles.....1892
Moore, George.....1859

NEW JERSEY.

Atlantic City.

Wescott, William Carter 1896

Bayonne.

Alpers, William Henry 1898

Bloomfield.

Scherff, John Philip 1877

Bordentown.

Carslake, George Middleton 1880

Bridgeton.

Dare, Charles Ford 1889

Camden.

Beringer, George Mahlon 1893

Chatham.

Dougherty, Samuel Edward 1875

East Orange.

Davis, William Mortimer 1879
Williams, Seward Whiting 1887

Elizabeth.

Frohwein, Richard 1867
Kent, Henry Avery, Jr 1880
Oliver, William Murray 1875

Englewood.

Rockefeller, Lucius 1880

Freehold.

Walker, John Putnam 1881

Hoboken.

KLUSSMANN, HERMANN 1876

Jersey City.

Abernethy, Maxwell 1865
Beardmore, William Arthur 1890
Foulke, James 1881
Gallagher, John Charles 1893
Hartnett, Eugene 1893
Lohmann, Herman Joseph 1896
Lyons, Fred. Wyckoff 1893
Vockroth, Emil 1893
White, George Henderson 1868

Keyport.

Warn, William Edgar 1886

Lakewood, Ocean Co.

Harrison, William John 1896

Madison.

Brown, William Thompson 1894

Matawan, Monmouth Co.

Slater, Frank Hovey 1882

Medford.

Thorn, Henry Prickett 1879

Morristown.

Carrell, Eugene Ayres 1875

Newark.

Betzler, Jacob 1880
HOLZHAUER, CHARLES 1873
Menk, Charles William 1898
Mennen, Gerhard 1888
Sayre, William Henry 1877
Smith, Charles Bradley 1868
Smith, Clarence Pennington 1890
Staebler, Richard Elmer Johannes 1892
Staehle, Louis Lorenz 1898
Stamford, William Harrison 1876
Van Winkle, Abraham 1871
Wuensch, Charles 1898

New Brunswick.

Kilmer, Frederick Barnett 1886

Perth Amboy.

Parisen, George Warren 1892

Plainfield.

Ollif, James Henry 1867
Reynolds, Howard Prescott 1875
Shaw, Robert Johnson 1897

Riverside.

Pine, Warren Carleton 1897

South Amboy.

JACQUES, GEORGE WASHINGTON 1869
Parisen, Allen Conrey 1895

NEW MEXICO.

East Las Vegas.

Portmann, Cæsar Augustus 1897

NEW YORK.

Albany.

Bradley, Frank Henry 1896
Bradley, Theodore James 1896
Gaus, Charles Henry 1879
Huested, Alfred Birch 1879

Michaelis, Gustavus 1882
Turner, George Heather 1880
Walker, William John 1880

Binghamton.

Otis, Clark Zelotes 1885

Brooklyn.

Anderson, William Christine 1900
Bartley, Elias Hudson 1893
Brooks, George Washington 1879
Brundage, Albert Harrison 1892
Colen, James Austin 1892
DeForest, William Pendleton 1879
DeJonge, Cornelius 1899
Dennin, Charles 1875
Dennin, Edwin Clinton 1892
Dewender, William Henry 1896
Douglass, Henry 1875
Dunn, John Augustus 1867
Eccles, Robert Gibson 1885
Englander, Samuel 1899
FOUGERA, EDMUND CHARLES HENRY. 1890
Haviland, Henry 1857
Krieger, Philip 1876
Levy, Adolph 1877
McElhenie, Thomas Diamond 1872
McMahon, Joseph 1897
OWENS, RICHARD JOHN 1860
Ray, Peter William 1892
Rosenzweig, Benjamin 1898
Snyder, Ambrose Chancellor 1867
Squibb, Edward Hamilton 1882
Topping, Charles Orlando 1899
Tuthill, Frederic Percival 1899
Webber, Joseph LeRoy 1886
Werner, Rudolph Carl 1892
Zellhoefer, George 1876

Buffalo.

Gregory, Willis George 1886
Hayes, Horace Phillips 1880
Lockie, James Alexander 1896
Peabody, William Huntington 1857
Rano, Charles Orlando 1866
Stoddard, Thomas 1900

Catskill.

Du Bois, William Laneman 1880

Corning.

Cole, Victor Le Roy 1890

Croton-on-Hudson.

Henry, Charles (Dworniczak) 1881

Dunkirk.

Davis, Eugene Miller 1892

Elmira.

HOLMES, CLAY WOOD 1873

Fillmore, Alleghany Co.

Ridgway, Lemuel Augustus 1882

Fishkill-on-Hudson.

Moith, Augustus Theodore 1860

Flushing.

Hepburn, John 1873

Geneseo, Livingston Co.

Rogers, Arthur Henry 1882

Croton.

Rhodes, Charles Orman 1895

Jamaica, Queens Co.

Baylis, Lewis Fosdick 1880
Goodale, Harvey Galusha 1879
Peck, George Lyman 1883

Middletown.

KING, JAMES THEODORE 1859
Rogers, William Henry 1869

Mount Vernon.

Blackmore, Henry Spencer 1896
Gill, George 1872

Newburg.

Chapman, Isaac Close 1887

New York City.

Allison, William Outis 1895
Alpers, William Charles 1890
Amend, Bernard Gottwald 1892
Amend, Otto Paul 1892
Aquaro, Joseph 1900
Balser, Gustavus 1875
Bigelow, Clarence Otis 1900
Billings, Henry Merry 1869
Boeddiker, Otto 1895
Chandler, Charles Frederic 1867
Coblentz, Virgil 1882
Cook, Thomas Penrose 1877
Diekman, George Charles 1898
Erb, Charles Stephan 1895
Ewing, John 1893
Faber, Walter Eberhard 1900
Fairchild, Benjamin Thomas 1875
Fairchild, Samuel William 1887

Fraser, Horatio Nelson 1888
Freid, Isadore 1897
Gane, Eustace Harold 1895
Gardner, Robert Winslow 1867
Geisler, Joseph Frank 1889
Goldmann, Oscar 1900
Gregorius, George Gustavus Chas. Wm, 1898
Hauenstein, William 1883
Haynes, David Oliphant 1887
Heydenreich, Emile 1867
Hirseman, Felix 1900
Hopkins, Jesse L 1898
Hudnut, Richard Alexander 1899
Jelliffe, Smith Ely 1895
Jungmann, Julius 1879
Kalish, Julius 1875
Kalish, Oscar G 1900
Keenan, Thomas John 1894
Kemp, Edward 1888
Kennedy, Ezra Joseph 1887
Kent, Robert Restieaux 1855
Kirchgasser, William Charles 1888
Lampa, Robert Raymond 1892
Louis, Leopold George 1807
Lovis, Henry Christian 1892
Main, Thomas Francis 1872
Massey, William Morton 1885
Mayo, Caswell Armstrong 1893
McIntyre, Byron Floyd 1876
McIntyre, Ewen 1873
McKesson, George Clinton 1888
McKesson, John, Jr 1867
MILHAU, EDWARD LEON 1858
Miller, Charles Elliott 1899
Molwitz, Ernest 1867
Murray, Benjamin Lindley 1896
O'Neil, Henry Maurice 1879
Osmund, Charles Alvin 1868
Parsons, Charles West 1899
Peters, John Miller 1896
Plaut, Albert 1894
Pleasants, Charles Henry 1890
Quackinbush, Benjamin Franklin 1886
RAMSPERGER, GUSTAVUS 1860
Rauschenberg, Sidney 1900
Reynolds, Charles Edward 1897
Rice, Charles 1870
Runyon, Edward Wheelock 1875
Rusby, Henry Hurd 1890
Sayre, Edward Augustus 1877
Schieffelin, William J 1892
Schimpf, Henry William 1894
Schmidt, Henry 1887
Schmidt, Ferdinand Traugott 1886
SEABURY, GEORGE JOHN 1876
Sieker, Ferdinand August 1803
Skelly, James Joseph 1866
Smith, Reuben Randolph 1890
Stewart, Francis Edward 1884
Takamine, Jokichi 1898
Tsheppe, Adolph 1876
Wichelns, Frederick 1881
Wickham, William Hull 1870
Wilson, William 1876

Oswego.

Butler, Charles Henry 1887

Platisburg.

Hitchcock, John E 1892

Fort Henry.

Smith, Edward Salvister 1890

Richfield Springs.

Smith, Willard Alfred 1880

Saratoga Springs.

Fish, Charles Frederick 1866

Stapleton, Staten Island.

Maguire, Edward Sylvester 1897
Miller Charles 1897

Syracuse.

Dawson, Edward Seymour, Jr 1876
Muench, William 1899
Snow, Charles Wesley 1876

Utica.

Blaikie, William 1879

Wellsville, Alleghany Co.

Hall, Edwin Bradford 1879

Yonkers.

Eschman, Frederick William Rudolph. 1880
Petsche, Franz Fred. Bismark Wilhelm. 1892

NORTH CAROLINA.

Asheville.

Pfafflin, Henry Adolph 1892
Smith, Whitefoord Gamewell 1892

Chapel Hill.

Howell, Edward Vernon 1900

Charlotte.

Walker, Thomas Arthur 1900
Wearn, William Henry 1888

Concord.

Johnson, Daniel Dudley 1894

Durham, Orange Co.

Vaughan, Parry Wyche 1882
Yearby, William Morgan 1894

Mt. Airy.

Banner, John 1898

Oxford.

Hancock, Franklin Willis 1888

Raleigh.

Birdsong, Edwin Grey 1898
Bobbitt, James Henry 1894
Hicks, Henry Thomas 1898
Simpson, William 1873

Scotland Neck.

Whitehead, Eugene Thomas 1900

Tarboro.

Macnair, Whitmel Horne 1898
Zoeller, Edward Victor 1878

Wilmington.

Hardin, John Haywood 1881

NORTH DAKOTA.

Fargo.

Christianson, Lars 1896

Grafton.

Haussamen, Henry Louis 1888

Jamestown.

White, Herbert Eugene 1897

Lakota.

St. John, Sydney Sylvester 1897

OHIO.

Arcanum.

Johnson, Joseph Henry 1899

Cambridge.

Ogier, John Morrison 1895

Canton.

Roth, Charles Robert 1900

Chillicothe.

Howson, Arthur Bayshawe 1886
Nipgen, John Alvin 1879

Cincinnati.

DeLang, Alfred 1887
Fennel, Charles Theodore Piderit 1886
Fieber, Gustavus Adolphus 1893
Gordin, Harry Mann 1899
Gordon, William John Maclester 1854
Greyer, Julius 1880
Heinemann, Otto 1864
Lloyd, John Uri 1870
Merrell, Charles George 1888
Merrell, George 1879
Phillips, Charles Wilson 1881
Ruppert, John 1880
Sauer, Lewis Wendlin 1882
Serodino, Herman 1880
Simonson, William 1887
Wagner, Henry 1876
Wetterstroem, Albert Frederick Charles. 1888
Wetterstroem, Theodore David 1897
YORSTON, MATTHEW MACKAY 1864
Zuenkeler, John Ferdinand 1887

Cleveland.

Arny, Harry Vin 1891
Benfield, Charles William 1893
Bruce, James 1882
Cardwell, James Robert 1899
Cobb, Robert Lathrop 1883
Feil, Joseph 1885
Foster, Charles Ebenezer 1898
Gleim, John Christopher 1893
Haake, William Henry 1893
Hannan, Owen Burdette 1893
Hechler, George Lewis 1882
Hopp, Lewis Christopher 1876
Krause, John 1900
Kuder, William Frank 1893
Lehr, Philip 1885
Myers, Daniel 1882
Richardson, Samuel William 1897
Schellentrager, Ernst August 1882
Schoenhut, Christian Henry 1888
Selzer, Eugene Reinhold 1893
Sherwood, Henry Jackson 1894
Sords, Thomas Vincent 1893
Urban, Jacob Philip 1881
Voss, George William 1885

Columbiana.

Ink, Charles Elliott 1885

Columbus.

Bruck, Philip Henry 1884

Byrne, John 1894
Hatton, Edward Melville 1878
Hatton, Ellmore Wright 1894
Huston, Charles 1872
Kaemmerer, William Frederick 1899
Kauffman, George Beecher 1882
Watson, George Hiram, Jr 1899
Rauschkolb, John 1894
Schueller, Frederick William 1880

Conneaut, Ashtabula Co.

Symonds, Arthur Henry 1892

Dayton.

Burkhardt, Mark Anthony 1887
Latin, George 1900

East Liverpool.

Bulger, Alvin H. 1899

Findlay.

Firmin, John Curtis 1893

Grand Rapids, Wood Co.

Thurston, Azor 1886

Jefferson, Ashtabula Co.

Case, Charles Henry 1892

Logan.

Harrington, Frank 1869

Middletown.

Johnson, Charles Brayton 1876

Navarre.

Grossklaus, John Ferdinand 1859

New Philadelphia.

Miller, William Harvey 1898

Scio.

Beal, James Hartley 1892

Springfield.

Casper, Thomas Jefferson 1867
Siegenthaler, Harvey Newton 1882

Wooster.

Ohliger, Lewis Philip 1871

Youngstown.

Cassaday, Orlin Ulysses 1899

OKLAHOMA TERRITORY.

Guthrie.

Lillie, Foress Ball 1900

Hennessey.

Dinkler, Frank A. 1900

McLoud.

Golden, Lee Hampton 1900

Oklahoma City.

Weaver, Francis Marion 1900

OREGON.

Ashland.

Sherwin, Eugene Alonzo 1889

Portland.

Blumauer, Louis 1889

The Dalles.

Blakeley, George Clarence 1892

PENNSYLVANIA.

Allegheny City.

Einstein, Morris 1900
Gleghorn, James Seymour 1900

Beaver, Beaver Co.

Andriessen, Hugo 1875

Butler.

Boyd, Charles Newton 1900

Carlisle.

Horn, Wilbur Fisk 1876

Chambersburg.

Keefer, Charles DeWalt 1891

Connellsville.

Berryhill, Henry Pennick 1890

Du Bois.

Hay, Charles La Mar 1898

Girardville.

Donaghue, James 1900
Donaghue, Theresa Veronica 1900

Harrisburg.

George, Charles Theodore 1873
Gorgas, George Albert 1884
Gross, Edward Ziegler 1883
Miller, Jacob Augustus 1873
Smith, Benjamin Franklin 1892

Haverford.

Harbaugh, Wilson Linn 1896

Johnstown.

Griffith, Charles 1900

Lancaster.

Heinitsh, Sigmund William 1889

Langhorne.

Hancock, Charles West 1900

League Island.

Gordon, Frederick Troup 1900
Scott, Theodore William 1899

Lebanon.

LEMBERGER, JOSEPH LYON 1858
Redsecker, Jacob Henry 1881

Lock Haven.

Prieson, Adolph 1880

Mercer.

Graham, Frank Reed 1897

Norristown.

Reed, Willoughby Henry 1893

Philadelphia.

BAUER, LOUIS GUSTAVUS 1867
Bohn, Charles Henry 1897
Borell, Henry Augustus 1874
BORING, EDWARD MCCURDY 1867
Burg, John Dellinger 1888
Cliffe, William Lincoln 1898
Dobbins, Edwards Tompkins 1867
Eddy, Henry Clay 1869
Ellis, Evan Tyson 1857
England, Joseph Winters 1893
Feidt, George David 1898
Fox, Peter Paul 1869
French, Harry Banks 1890
Gano, William Hubbell 1892
Guise, P. Nettleton 1897
HANCE, EDWARD HANCE 1857
Hassinger, Samuel Eliphat Reed 1880
Haussmann, Frederick William 1895
Heintzelman, Joseph Augustus 1858
Hoch, Aquila 1896
Jenks, William Jenks 1858
Jones, Alexander Henry 1874
Kebler, Lyman Frederic 1894
Keeney, Caleb Reynolds 1868
Kline, Mahlon Norwood 1878
Koch, Louis 1872
Kraemer, Henry 1892
Krewson, William Egbert 1875
LaWall, Charles Herbert 1896
Lincoln, George Washington 1899
Lowe, Clement Belton 1895
Maisch, Henry Charles Christian 1900
Matusow, Harry 1897
McIntyre, William 1868
Mellor, Alfred 1864
MILLER, ADOLPH WILLIAM 1868
Milligan, Decatur 1867
Moerk, Frank Xavier 1898
MOORE, JOACHIM BONAPARTE 1860
Morison, John Louis Dales 1895
Morris, Lemuel Iorwerth 1880
Mulford, Henry Kendall 1896
Ottinger, James Jeremiah 1876
Peacock, Bertha Leon 1895
Peacock, Josiah Comegys 1892
Perot, Thomas Morris 1857
Pile, Gustavus 1881
Potts, David Gardiner 1893
Preston, David 1868
Procter, Wallace 1874
REMINGTON, JOSEPH PRICE 1867
Rittenhouse, Henry Norman 1857
Sadtler, Samuel Philip 1893
Shafer, Erwin Clement 1893
SHINN, JAMES THORNTON 1860
Shoemaker, Richard Martin 1869
Stedem, Frederick William Edward 1892
Stedem, Laurence Sylvester Aloysious 1900
Stroup, Freeman Preston 1900
Thompson, William Beatty 1858
Warner, William Richard 1857
Webb, William Henry 1867
Weidemann, Charles Alexander 1868
Wendell, Henry Edward 1873
Wiegand, Thomas Snowden 1857

Pittsburgh.

Emanuel, Lewis 1878
Hays, Joseph Anthony 1892
Henderson, Archibald Keys 1888
Koch, Julius Arnold 1892
Lohmeyer, Henry Louis 1900
Schaeffer, Emil August 1900

Pottstown.

Byers, Huizinga Clarence 1900

Pottsville.

Diebert, Thomas Irvin 1882
Kennedy, George Washington 1869

Reading.

Weida, Charles Arthur 1896
Ziegler, Philip Milton 1867

Scranton.

Thomas, Daniel Judson 1900

Shamokin.

Smink, Robert William 1893

Sharpsburg.

Patrick, Elmer Alcorn 1900

Towanda.

PORTER, HENRY CARROLL 1872

West Chester.

Evans, Joseph Spragg 1877

Williamsport.

Cornell, Edward Augustus 1873
Duble, Jesse Balderston 1870

York.

Alexander, Charles Ellis 1899
Patton, John Franklin 1880

RHODE ISLAND.

Narragansett Pier.

Tobin, John Martin 1887

Newport.

Downing, Benjamin Franklin, Jr. 1886
Huntington, William Hunter 1891
Wood, John William 1897

Providence.

Blanding, William Oliver 1894
Danforth, Edmund Culver 1878
Fenner, Alexander Wilson, Jr 1888
Greene, William Ray 1883
Lyon, George Calvin 1899
O'Hare, James 1888
Pearce, Howard Anthony 1894
Potter, William Robert 1894
Wood, Mason Bowen 1882

Westerly.

Collins, Albert Burlingame 1882

Woonsocket.

Jackson, Frank Anthony 1900
Simmons, Frank Birtles 1897

SOUTH CAROLINA.

Anderson.

Ligon, John Temple 1900
Wilhite, Frank Turner 1893

Camden.

Zemp, William Robinson 1900

Charleston.

Aimar, Charles Pons 1879
Plenge, Henry Charles 1894

Columbia.

Thomas, Oscar Ernest 1

Greenville.

Carpenter, Alfred Baxter 1898

SOUTH DAKOTA.

Watertown.

Jones, David Franklin 1805

Yankton.

Brecht, Frederick Adolph 1895

TENNESSEE.

Chattanooga.

Greve, Charles Mathias 1887
Voigt, Joseph Frederick 1893

Clarksville.

Lockert, Charles Lacy 1894

Columbia.

Rains, Aris Brown 1894

Humboldt.

Thweatt, Archibald 1900

Knoxville.

Rosenthal, David Abraham 1894

Memphis.

ROBINSON, JAMES SCOTT 1869
Treherne, John Curtis 1894

Nashville.

Burge, James Oscar 1878
McGill, John Thomas 1900
Ruddiman, Edsel Alexander 1894
Steiner, Samuel Gideon 1899

TEXAS.

Dallas.

De Lorenzi, Albert 1890
Eberle, Eugene Gustavus 1896

Galveston.

Cline, Raoul Réné Daniel. 1898
Orton, Ingomar Francois.....1891

Hearne.

Hazlett, James Lupe 1900

Houston.

Burgheim, Jacob 1892

Paris.

Greiner, William Edward 1892

Pittsburg.

Greer, Samuel Rufus 1900

San Antonio.

Forston, Keene Richards.....1899
Pfeiffer, John.....1898
Schmitt, George Joseph Francis... ..1890

Sherman.

Sheehey, Henry Lee 1898

Taylor.

Thames, Joseph Jefferson 1895

UTAH.

Salt Lake City.

Hill, Frederick John 1895

VERMONT.

Brandon.

Hopkins, Zerah Blaisdell.....1900

Brattleboro.

Root, Wilfred Franklin.....1898

Montpelier.

Blakely, Collins.....1899
Greene, Lester Henry 1899
Slade, Harry Allen..... ..1899
Terrill, Willis Ethel.....1899

Northfield.

Sanborn, George Cassius.....1899

Rutland.

Higgins, Albert Warren 1895

St. Albans.

Dutcher, Alfred Luther.....1892

St. Johnsbury.

Bingham, Charles Calvin ... .1875

VIRGINIA.

Charlottesville.

Maphis, Charles Gilmore.....1898

Danville.

Cole, Howson White 1882
Neal, Charles Chaplin.....1899

Falls Church.

Church, Merton Elbridge 1892

Forksville.

Walker, Emmett Edward 1900

Fredericksburg.

Hall, Horace Byrd.....1896

Lynchburg.

Goldsborough, Charles Henry.....1898

Newport News.

Burgess, William Gaither.....1898
Klor, Alexander Edward George 1899

Norfolk.

Baker, Maury Davison..... 1897
MacRae, John Young 1894
McLarty, Colin.....1898
Price, Roger Taylor..... 1899

Richmond.

Baker, Thomas Roberts.....1856
Barksdale, George Edwards 1900
Briggs, Andrew Gessner 1890
Chelf, Thomas Wilber 1900
Harrison, Richard Heth Munford....1895
Harrison, Robert Lucius.....1900
Miller, Turner Ashby.....1894
Reade, Frank Marshall.....1900
Scott, William Henry 1873
Snook, William Howard 1900

Roanoke.

Massie, Paul 1899

South Boston.

Faulkner, Garland Estes 1898

Suffolk.

Hall, Joseph Patton 1900

WASHINGTON.

La Connor, Skagit Co.

Joergensen, Gerhard Johan Carl Sophus. 1889

New Whatcom.

Nicholson, Edgar Lawrence.....1920

Pullman.

Watt, George Henry.....1896

Seattle.

Holmes, Henry Elliott.....1880
Osseward, Cornelius.....1897

Snohomish.

Wilbur, Lot.....1896

Tacoma.

Cummings, Henry Thornton.....1853

WEST VIRGINIA.

Wheeling.

Williams, William Hudson.....1880

WISCONSIN.

La Crosse.

Beyschlag, Charles.....1880

Madison.

Kremers, Edward.....1887
Schreiner, Oswald.....1900

Mayville, Dodge Co.

Sauerhering, Rudolph Aurelius.....1884

Medford.

Hammel, Joseph.....1887

Milwaukee.

Conrath, Adam.....1881
Dadd, Robert Morrow.....1896
DRAKE, JOHN RANSOM.....1860
Frank, Herman Otto.....1898
Kettler, Edward, Jr.....1896
Kienth, Hans.....1884
Raeuber, Edward Gottfried.....1900
Ruenzel, Henry Gottlieb.....1892
Schrank, Charles Henry.....1876

Neillsville.

Sniteman, Charles Clarence.....1881

WYOMING.

Rawlins.

Stuver, Emanuel.....1895

DOMINION OF CANADA.

MANITOBA.

Winnepeg.

Flexon, Charles.....1897

NEW BRUNSWICK.

St. John.

Coupe, Robert Edward.....1894

NOVA SCOTIA.

Halifax.

Simson, Francis Cook.....1876

ONTARIO.

Hamilton.

Clark, John Alexander.....1890

Ottawa.

SAUNDERS, WILLIAM.....1860
Watters, Henry.....1896

Stratford.

WAUGH, GEORGE JAMES.....1862

Toronto.

Heebner, Charles Frederick.....1894
Robinson, Ernest Frankish.....1889

Windsor.

D'Avignon, John Eugene.....1888

Woodstock.

Karn, William Alfred.....1898

QUEBEC.

Montreal.

Baridon, Louis Richard.....1890
Gray, Henry Robert.....1867
Howey, John Joseph.....1896
Lachance, Seraphin.....1888
Lanctot, Henri Raymond.....1894
Morrison, Joseph Edward.....1888

Quebec.

Willis, Henry.....1897

St. Hyacinthe.

St. Jacques, Gaston.....1900

Three Rivers.

Williams, Richard Wellington.....1883

MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Bowen, William Africanus, Mombasa, British East Africa 1897
Cowan, John, Cavite, P. I. 1897
Graham, Clarence Montrose, Manila, P. I. 1897
Heyl, James Bell, Hamilton, Bermuda 1863
Jorgenson, Hans Christian, Gibrara, Cuba 1899
Martin, Nicholas Henry, Gateshead on Tyne, England 1891
POWER, FREDERICK BELDING, London, England 1872
Rumsey, Samuel Louis, Honolulu, Hawaiian Islands 1876
WELLCOME, HENRY SOLOMON, London, England 1875

MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Leitch, Arthur 1860
McConville, Thomas Aloysius 1864
McPherson, George 1865
Wardell, Robert C. 1860

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

Attfield, Dr. John, F. R. S., Watford, England.
Carteighe, Michael, F. I. C., 180 New Bond St., London, W., England.
Hoffmann, Dr. Frederick, Kant Strasse 125, Charlottenburg, Berlin, Germany.
Holmes. E. M., F. L. S., 17 Bloomsbury Square, London, W. C., England.
Hooper, David, F. I. C., F. C. S., Indian Museum, 1 Sudder St., Calcutta, India.
Ince, Joseph, F. L. S., Glenholme, 13 Albert Road, Acton, W., London, England.
Martenson, Staatsrath J. von, Kinderhospital des Prinzen von Oldenburg, St. Petersburg, Russia.
Martindale, Wm., F. L. S., F. C. S., 10 New Cavendish St., W., London, England.
Schacht, Dr. Karl, 56 Mittelstrasse, Berlin, N. W., Germany.
Schaer, Dr. Edward, Professor of Pharmacy, pharmaceutisches Institut der Universität, Strassburg, Germany.
Schmidt, Professor Dr. Ernst, Geh. Regierungsrath, Marburg, Germany.

ACTIVE MEMBERS.

Members are requested to notify the General Secretary of errors or inaccuracies in the following list. The Association will not replace volumes of Proceedings lost through changes of residence of which the General Secretary has not been notified. See Proceedings, 1866, p. 66.

Abernethy, Maxwell,
188 Newark ave., Jersey City, N. J.
Adamick, Gustave H.,
189 E. Madison st., Chicago, Ill.
Aimar, Charles P.,
411 King st., Charleston, S. C.
Allen, E. Floyd,
1538 Nicollet ave., Minneapolis, Minn.
Allen, John H.,
3892 Delmar ave., St. Louis, Mo.
Alexander, Chas. E.,
112 N. Duke st., York, Pa.
Allison, William O.,
100 William st., New York, N. Y.
Alpers, William C.,
45 W. 31st st., New York, N. Y.
Alpers, William H.,
302 Ave. D., Bayonne, N. J.
Amend, Bernard G.,
205 3d ave., New York, N. Y.
Amend, Otto P.,
205 3d ave., New York, N. Y.
Anderson, Samuel,
48 Front st., Bath, Me.
Anderson, Wm. C.,
320 Lafayette ave., Brooklyn, N. Y.
Andriessen, Hugo,
P. O. Box 39, Beaver, Beaver Co., Pa.
Appleby, Samuel N.,
Calvert & Pleasant sts., Baltimore, Md.
Aquaro, Joseph,
202 Spring st., New York, N. Y.
Ardery, Lorimer,
106 N. Main st., Hutchinson, Kan.
Argenti, Jerome J. B.,
2944½ Mission st., San Francisco, Cal.
Arnold, Chas. F.,
1201 4th st., Sioux City, Ia.
Arny, Harry V.,
782 Republic st., Cleveland, O.
Arrington, Homer H.,
Summerville, Ga.
Aughinbaugh, David C.,
54 W. Washington st., Hagerstown, Md.
Averill, William H.,
435 Main st., Frankfort, Ky.
Axness, Ole M.,
Pelican Rapids, Otter Tail Co., Minn.
Bailey, Frederick,
P. O. Box 314, Lowell, Mass.
Baird, Julian W.,
Mass. Coll. Pharm., Boston, Mass.
Baker, Edwin,
Bridge st., Shelburne Falls, Mass.
Baker, Maury D.,
U. S. R. S. Franklin, Navy Yard, Norfolk, Va.
Baker, T. Roberts,
3101 East Main st., Richmond, Va.
Ball, Charles E.,
221 High st., Holyoke, Mass.
Ballard, John W.,
106 West 2d st., Davenport, Ia.
Balser, Gustavus,
137 Avenue B, New York, N. Y.
Banner, John,
Main st., Mt. Airy, N. C.
Barbat, Josephine E.,
1310 Folsom st., San Francisco, Cal.
Baridon, Louis R.,
1703 St. Catharine st., Montreal, Can.
Baril, Joseph B.,
1331 Elm st., Manchester, N. H.
Barksdale, George E.
3900½ Williamsburg ave., Richmond, Va.
Barnett, Joel J.,
428 McDonough st., Montgomery, Ala.
Bartells, George C.,
130 East State st., Camp Point, Ill.
Barth, Geo. F.,
State st., North Alton, Ill.

Bartlett, N. Gray,
22d st. & Indiana ave., Chicago, Ill.
Bartley, Elias H.,
21 Lafayette ave.. Brooklyn, N. Y.
Base, Daniel,
329 N. Schroeder st., Baltimore, Md.
Bassett, Charles H.,
109 Arch st., Boston, Mass.
BAUER, LOUIS G.,
635 N. 5th st., Philadelphia, Pa.
Baughman, John H.,
612 N. Fremont ave., Baltimore, Md.
Baur, Jacob,
76 Illinois st., Chicago, Ill.
Baylis, Lewis F.,
388 Fulton st., Jamaica, Queens Co., N. Y.
Bayly, Charles A.,
Grant ave. & Sutter st., San Francisco, Cal.
Beal, James H.,
Scio, O.
Beardmore, William A.,
389 Summit ave., Jersey City, N. J.
Beck, John G.,
1538 N. Caroline st., Baltimore, Md.
Becker, Charles L.,
304 Main st., Ottawa, Kan.
Behrens, Emil C. L.,
802 S. Halstead st., Chicago, Ill.
Behrens, Paul J.,
727 W. Indiana st., Chicago, Ill.
Beitenman, William W.,
2d st., & Bennett ave., Cripple Creek, Colo.
Bell, Emil R.,
2500 W. Market st., Louisville, Ky.
Bell, S. Howard,
Lock Box 121, Derry Depot, N. H.
Belt, James F.,
8th st. & Madison ave., Covington, Ky.
Benfield, Charles W.,
Willson & Payne aves., Cleveland, O.
Bennett, James N.,
853 Main st., Hartford, Conn.
Benton, Wilber M.,
Main st. & Jefferson ave., Peoria, Ill.
Beringer, George M.,
501 Federal st., Camden, N. J.
Berryhill, Henry P.,
Buttermore Block, Connellsville, Pa.
Best, John,
1 German Block, Central City, Colo.
Betzler, Jacob,
593 Orange st., Newark, N. J.
Beyschlag, Charles,
503 Main st., La Crosse, Wis.
Bigelow, Clarence O.,
102 Sixth ave., New York, N. Y.
Billings, Henry M.,
29 W. 50th st., New York, N. Y.
Bingham, Charles C.,
37 Main st., St. Johnsbury, Vt.
Bingham, Wm. E.,
Tuscaloosa, Ala.
Birdsong, Edwin G.,
445 Halifax st., Raleigh, N. C.
BIROTH, HENRY,
481 25th st., Chicago, Ill.
Bishop, Samuel E.,
37 Rush st., Chicago, Ill.
Blackmore, Henry S.,
206 S. 9th ave., Mt. Vernon, N. Y.
Blaikie, William,
202 Genesee st., Utica, N. Y.
Blake, James E.,
96 N. 2d st., New Bedford, Mass.
Blakely, Collins,
3 State st., Montpelier, Vt.
Blakely, George C.,
175 2d st., The Dalles, Ore.
Blanding, Wm. O.,
54 Weybosset st., Providence, R. I.
Blank, Alois,
1353 S. 5th st., St. Louis, Mo.
Blumauer, Louis,
4th & Morrison sts., Portland, Ore.
Bobbitt, James H.,
233 Fayetteville st., Raleigh, N. C.
Boeddiker, Otto,
954 6th ave., New York, N. Y.
Boehm, Solomon,
800 Morgan st., St. Louis, Mo.
Boerner, Emil L.,
113 Washington st., Iowa City, Ia.
Bohn, Carl H.,
2d & Poplar sts., Philadelphia, Pa.
Bond, John B.,
Main & 5th sts., Little Rock, Ark.
Borell, Henry A.,
2043 Chestnut st., Philadelphia, Pa.
BORING, EDWIN M.,
929 Fairmount ave., Philadelphia, Pa.
Bowen, William A.,
Mombasa, British East Africa.
Boyce, Samuel F.,
335 W. Superior st., Duluth, Minn.

Boyd, Charles N.,
Main st., Butler, Pa.
Boyd, George W.,
C st., N. E., near 2d, Washington, D. C.
Boyden, Edward C.,
Joy & Myrtle sts., Boston, Mass.
Boynton, Herschell,
74 Main st., Biddeford, Me.
Brack, Charles E.,
Ensor & Forrest sts., Baltimore, Md.
Bradbury, Wymond H.,
808 I st., N. W., Washington, D. C.
Bradley, Frank H.,
207 Madison st., Albany, N. Y.
Bradley, Theodore J.,
Albany Coll. Pharm., Albany, N. Y.
Brandenberger, Adolph,
130 E. High st., Jefferson City, Mo.
Braunwarth, Alice L.,
114 E. 2d st., Muscatine, Ia.
Brecht, Frederick A.,
209 3d st., W., Yankton, S. Dak.
Brewer, John W.,
Hammond, La.
Brickman, Arthur O.,
500 E. Baltimore st., Baltimore, Md.
Briggs, Andrew G.,
204 Howitzer Place, Richmond, Va.
Brigham, Lawrence S.,
25 Dexter ave., Montgomery, Ala.
Brisley, Harry,
Prescott, Ariz.
Broe, James A.,
478 Congress st., Portland, Me.
Brooks, George W.,
1161 Myrtle ave., Brooklyn, N. Y.
Brown, Albert E.,
14 N. Water st., Mobile, Ala.
Brown, George S.,
2801 St. Charles ave., New Orleans, La.
Brown, William A.,
Eagle Drug store, Winnemucca, Nev.
Brown, William T.,
Box 19, Madison, N. J.
Bruce, James,
544 Prospect st., Cleveland, O.
Bruck, Philip H.,
961 S. High st., Columbus, O.
Brundage, Albert H.,
1153 Gates ave., Brooklyn, N. Y.
Brunner, Chas. H.,
148 6th st., Fremont, Neb.
Brunner, Norman I.,
4th & Arch sts., Macon, Ga.
Buchheit, Aug. W.
119 W. 3d st., Grand Island, Neb.
Buck, John L.,
25 County Road, Chelsea, Mass.
Bulger, Alvin H.,
6th & W. Market sts., East Liverpool, O.
Bunker, Elihu,
403 Purchase st., New Bedford, Mass.
Burg, John D.,
4th & Brown sts., Philadelphia, Pa.
Burge, James O.,
Church & High sts., Nashville, Tenn.
Burgess, Wm. G.,
Washington av. & 26th st., Newport News, Va.
Burgheim, Jacob,
1019 Congress ave, Houston, Tex.
Burkhardt, Mark A.,
Third & St. Clair sts., Dayton, O.
Burnham, Alfred A., Jr.,
459 Dudley st., Boston, Mass.
Burns, Edwin M.,
201 S. Main st., Mason City, Ia.
Burrough, Horace,
509 W. Lombard st., Baltimore, Md.
Burwell, Arthur C.,
569 Washington st., Boston, Mass.
Butler, Charles H.,
182 W. 1st st., Oswego, N. Y.
Butler, Freeman H.,
141 Central st., Lowell, Mass.
Button, Charles E.,
744 W. Van Buren s., Chicago, Ill.
Byers, Huizinga C.,
28 King st., Pottstown, Pa.
Byrne, John,
200 N. High st., Columbus, O.
Campbell, George D.,
Main st., Lonaconing, Md.
CANDIDUS, PHILIP C.,
Mobile, Ala.
CANNING, HENRY,
109 Green st., Boston, Mass.
Capper, Wm. E.,
31 School st., Boston, Mass.
Cardwell, James R.,
83 Eglindale ave., Cleveland, O.
Carlson, Swan B.,
Willmar, Minn.
Carpenter, Alfred B.,
Main st., Greenville, S. C.

Carrell, Eugene A.,
South st., Morristown, N. J.
Carslake, George M.,
Farnsworth ave., Bordentown, N. J.
Carter, Frank H.,
772 Massachusetts ave., Indianapolis, Ind.
Case, Charles H.
Jefferson, Ashtabula Co., O.
Caspari, Charles, Jr.,
Maryland Coll. Pharm., Baltimore, Md.
Caspari, William, Jr.,
1600 Druid Hill ave., Baltimore, Md.
Casper, Thomas J.,
41 E. Main st., Springfield, O.
Cassaday, O. U.,
14 W. Federal st., Youngstown, O.
Chabot, David P.,
Jewett City, Conn.
Chandler, Charles F.,
41 E. 49th st., New York, N. Y.
Chapman, Isaac C.,
111 Water st., Newburgh, N. Y.
Charroppin, Emile L.,
Port Allen, La.
Cheatham, Thomas A.,
Mulberry & 3d sts., Macon, Ga.
Chelf, T. Wilber,
106 N. Pine st., Richmond, Va.
Christianson, Lars,
402 Front st., Fargo, N. D.
Church, Merton E.,
Falls Church, Va.
Claflin, Walter A.,
Harvard Square, Cambridge, Mass.
Clark, James R.,
502 Francis st., St. Joseph, Mo.
Clark, John A.,
East King st., Hamilton, Ontario, Can.
Cliffe, Wm. L.,
2778 Kensington ave., Philadelphia, Pa.
Cline, Raoul R. D.,
924 Market st., Galveston, Tex.
Cobb, Ralph L.,
112 Superior st., Cleveland, O.
Coblentz, Virgil,
115 W. 68th st., New York, N. Y.
Cole, Howson W.,
429 Main st., Danville, Va.
Cole, Victor L.,
22 East Market st., Corning, N. Y.
Colen, James A.,
383 Court st., Brooklyn, N. Y.
Collier, William K.,
199 E. 7th st., St. Paul, Minn.
Collins, Albert B.,
48 Main st., Westerly, R. I.
Colton, James E.,
766 Tremont st., Boston, Mass.
Cone, John W.,
55 Beacon st., Hartford, Conn.
Conrad, John,
25 E. 47th st., Chicago, Ill.
Conrath, Adam,
630 Chestnut st., Milwaukee, Wis.
Cook, Thomas P.,
114 William st., New York, N. Y.
COOMBS, CHARLES E.,
276 Massachusetts ave., Boston, Mass.
Cornell, Edward A.,
Pine & 4th sts., Williamsport, Pa.
Corning, Albion J.,
1501 Bolton st., Baltimore, Md.
Coupe, Robert E.,
578 Main st., St. John, New Brunswick.
Cowan, John,
U. S. Naval Hospital, Cavite, P. I.
Craighead, Gordon G.,
Aux Vasse, Mo.
Cramer, Max,
1350 Tremont st., Boston, Mass.
Crampton, Ferd L.,
2301 Lexington ave., Kansas City, Mo.
Crane, Frank T.,
Main st., Machias, Me.
Crecelius, Chas. E.,
Main & Pearl sts., New Albany, Ind.
Criswell, Francis M.,
7th & Florida ave., N. W., Washington, D. C.
Cronheim, Solomon,
51 E. Alabama st., Atlanta, Ga.
Crossman, George A.,
Raynham, Mass.
Crowdle, John E.,
81 Gardiner st., Newton, Mass.
Crum, John D.,
3d ave. & Pine st., Oakl'd, Jacksonville, Fla.
Culbreth, David M. R.,
203 E. Preston st., Baltimore, Md.
Cummings, Henry T.,
1516 So. E. st., Tacoma, Wash.
Curry, David W.,
200 Broad st., Rome, Ga.
Curry, Gordon L.,
104 W. Chestnut st., Louisville, Ky.

Dadd, Robert M.,
221 Grand ave., Milwaukee, Wis.
Danek, John F.,
1228 Washington ave., Minneapolis, Minn.
Danforth, Edmund C.,
654 N. Main st., Providence, R. I.
Dare, Charles F.,
84 E. Commerce st., Bridgeton, N. J.
Davies, Llewellyn P.,
Central City, Colo.
D'Avignon, J. Eugene,
55 Sandwich st., Windsor, Ont., Can.
Davis, Charles L.,
63 State st., Newburyport, Mass.
Davis, Eugene M.,
309 Lion st., Dunkirk, N. Y.
Davis, John A.,
700 N. Carey st., Baltimore, Md.
Davis, William M.,
123 Washington st., East Orange, N. J.
Dawson, Edward S., Jr.,
125 S. Salina st., Syracuse, N. Y.
Dawson, John H.,
23d & Valencia sts., San Francisco, Cal.
Day, William B.
465 State st., Chicago, Ill.
De Forest, William P.,
397 Classon ave., Brooklyn, N. Y.
De Jonge, Cornelius,
19 Vine st., Brooklyn, N. Y.
De Lang, Alfred,
Broadway & 4th st., Cincinnati, O.
De Lorenzi, Albert,
Main & Ervay sts., Dallas, Tex.
De Reeves, A. Eugene,
Cambridge, Md.
Dearborn, George L.,
156 Main st., New Market, N. H.
Dennin, Charles,
383 Court st., Brooklyn, N. Y.
Dennin, Edwin C.,
383 Court st., Brooklyn, N. Y.
Depeyre, Louis N.,
3341 Clear Creek ave., Denver, Colo.
Devine, John,
Santa Monica, Cal.
Dewender, Wm. H.,
169 Atlantic st., Brooklyn, N. Y.
Dewoody, William L.,
Pine Bluff, Jefferson Co., Ark.
Dickinson, Arthur L.,
297 Main st., Danbury, Conn.
Diebert, Thomas I.,
103 North Centre st., Pottsville, Pa.
DIEHL, C. LEWIS,
3d ave. & Broadway, Louisville, Ky.
Diekman, George C.,
115 W. 68th st., New York, N. Y.
Dill, J. Byron,
187 S. Meridian st., Indianapolis, Ind.
Dilly, Oscar C.,
2101 W. Walnut st., Louisville, Ky.
Dimmitt, Addison,
5th ave. & Walnut st., Louisville, Ky.
Dimock, Robert H.,
303 Congress st., New Haven, Conn.
Dinkler, Frank A.,
Hennessey, Okla. Ter.
Dixon, J. Marion,
Julia st. & Washington ave., Titusville, Fla.
Dobbins, Edward T.,
1100 Washington ave., Philadelphia, Pa.
Dohme, Alfred R. L.,
Pratt & Howard sts., Baltimore, Md.
DOHME, CHARLES E.,
Pratt & Howard sts., Baltimore, Md.
Dohme, C. Louis,
Pratt & Howard sts., Baltimore, Md.
DOHME, LOUIS,
Pratt & Howard sts., Baltimore, Md.
Dolan, Frank L.,
Freeman, Cass Co., Mo.
Doliber, Thomas,
Atlantic ave. & India st., Boston, Mass.
Donaghue, James,
Second st., Girardville, Pa.
Donaghue, Theresa V.,
Second st., Girardville, Pa.
Dorr, George W.,
118 Main st., Waterville, Me.
Doty, Wirt P.,
789 Woodward ave., Detroit, Mich.
Dougherty, Samuel E.,
Chatham, N. J.
Douglass, Henry,
614 Wythe ave., Brooklyn, N. Y.
Douglass. Stephen W.,
U.S.R.S. Wabash, Navy Yard, Boston, Mass.
Downing, Benjamin F., Jr.,
42 Broadway, Newport, R. I.
Drake, Frederick T.,
9 Washington st., Stoneham, Mass.
DRAKE, JOHN R.,
365 E. Water st., Milwaukee, Wis.

Dresser, George E.,
Main st., Putnam, Conn.
Drew, Walter I.,
202 Brackett st., Portland, Me.
Drury, Linus B,
Warren & Dudley sts., Boston, Mass.
Duble, Jesse B.,
Pine & 4th sts., Williamsport, Pa.
Du Bois, William L.,
281 Main st., Catskill, N. Y.
Duckett, Walter G.,
22d st. & Penna. ave., Washington, D. C.
Duggan, James,
50 Main st., Norwich, Conn.
Dunn, John A.,
36 Doughty st., Brooklyn, N. Y.
Dunwody, Richard G.,
369 Piedmont ave., Atlanta, Ga.
Du Puy, Eugene,
1095 23d st., Detroit, Mich.
Durban, Sebastian C.,
708 Broad st., Augusta, Ga.
Durkee, Wm. C.,
392 Boylston st., Boston, Mass.
Dutcher, Alfred L.,
109 Main st., St. Albans, Vt.
Eads, Robert I.,
100 E. New York st., Indianapolis, Ind.
Eagny, James T.,
726 Grand ave., New Haven, Conn.
Easterday, Herbert C.,
700 New Jersey ave. N.W., Washington, D.C.
Eberbach, Ottmar,
25 South Main st., Ann Arbor, Mich.
Eberle, Eugene G.,
Care Texas Drug Co., Dallas, Tex.
Ebert, Albert E.,
426 State st., Chicago, Ill.
Eccles, Robert G.,
191 Dean st., Brooklyn, N. Y.
Eckford, Joseph Wm.,
Commerce st., Aberdeen, Miss.
Eckstein, Andrew J.,
125 N. Minnesota st., New Ulm, Minn.
Eddy, Henry C.,
18th & Lombard sts., Philadelphia, Pa.
Edwards, Frederick B.,
55 Farmington ave., Hartford, Conn.
Ehrlicher, Henry M.,
334 Court st., Pekin Ill.
Eichrodt, Charles W.,
227 S. Illinois st., Indianapolis, Ind.
Einstein, Morris,
1424 East st., Allegheny City, Pa.
Eliel, Leo,
230 W. Washington st., South Bend, Ind.
Elliott, Chas. H.,
14th & Binney sts. N. W., Washington, D. C.
Elliott, Henry A.,
673 W. Lexington st., Baltimore, Md.
Ellis, Evan T.,
335 S. 18th st., Philadelphia. Pa.
Emanuel, Louis,
2d ave. & Grant st., Pittsburg, Pa.
Emich, Columbus V.,
423 N. Howard st., Baltimore, Md.
England, Joseph W.,
415 N. 33d st., Philadelphia, Pa.
Englander, Samuel,
Navy Yard, Brooklyn, N. Y.
Eppley, James K.,
2308 14th st. N. W., Washington, D. C.
Erb, Charles S,
121 Amsterdam ave., New York, N. Y.
Ernst., Frank F.,
186 Lamartine st., Jamaica Plain, Mass.
Eschman, F. W. R.,
P. O. Box 875, Yonkers, N. Y.
Estabrook, Henry A.,
Fitchburg, Mass.
Esters von Krakau, W.,
25th & Folsom sts., San Francisco, Cal.
Etzel, John L.,
Clear Lake, Cerro Gordo, Ia.
Evans, Joseph S.,
P. O. Drawer 12, West Chester, Pa.
Ewell, Ervin E.,
3644 13th st. N. W., Washington, D. C.
Ewing, John,
20 St. Nicholas Place, New York, N. Y.
Ewing, Mary S.,
745 Massachusetts ave., Boston, Mass.
Eyssell, George,
1036 Union ave., Kansas City, Mo.
Faber, Walter E.,
313 Bowery, New York, N. Y.
Fairchild, Benjamin T.,
P. O. Box 1120, New York, N. Y.
Fairchild, Samuel W.,
84 Fulton st., New York, N. Y.
Falk, John C.,
2700 Stoddard st., St. Louis, Mo.
Farrar, Samuel R.,
Opera House Block, Lebanon, Mo.

Faulkner, Garland E.,
Main st., South Boston, Va.
Feidt, George D.,
604 Arch st., Philadelphia, Pa.
Feil, Joseph,
513 Giddings ave., Cleveland, O.
Fennel, Charles T. P.,
8th & Vine sts., Cincinnati, O.
Fenner, Alexander W., Jr.,
479 Westminster st., Providence, R. I.
Fieber, Gustavus A.,
100 Spring Grove ave., Cincinnati, O.
Field, Claud,
318 E. St. Clair st., Indianapolis, Ind.
Field, Wm. C.,
H and 3d sts. N. E., Washington, D. C.
Finch, Chas. S.,
134 Atlantic st., Stamford, Conn.
Fink, Frederick Wm.,
Minnesota Sugar Co., St. Louis Park, Minn.
Finlay, Alexander K.,
186 Camp st., New Orleans, La.
Firmin, John C.,
319 S. Main st., Findlay, Hancock Co., O.
Fischer, Oscar F.,
1558 Wabash ave,, Chicago, Ill.
Fish, Chas. F.,
348 Broadway, Saratoga Springs, N. Y.
Fisher. Elbert E.,
144 Park ave., Bridgeport, Conn.
Fisher, George W.,
De Land, Fla.
Flemer, Lewis,
1418 14th st. N. W., Washington, D. C.
Fletcher, John W.,
Main st., Batesville, Ark.
Flexon, Charles,
Clarendon Hotel, Winnipeg, Can.
Ford, Charles M.,
700 15th st., Denver, Colo.
Forston, Keene R.,
San Antonio, Tex.
Foster, Charles E.,
Hough ave., cor. Crawford, Cleveland, O.
Fouch, William M.,
1 North ave. W., Baltimore, Md.
FOUGERA, EDMUND C. H.,
309 8th st., Brooklyn, N. Y.
Foulke, James,
107 Monticello ave., Jersey City Heights, N.J.
Fox, Peter P.,
Woodland ave & 73d st., Philadelphia, Pa.
Frames, J. Fuller,
601 N. Gay st., Baltimore, Md.
Frank, Hermann O.,
49 Biddle st., Milwaukee. Wis.
Franzoni, Joseph D.,
627 Penna. ave. N. W., Washington, D. C.
Fraser, Horatio N.,
262 5th ave., New York, N. Y.
Frauer, Herman E.,
246 E. Washington st., Indianapolis, Ind.
Freid, Isadore,
333 Willis ave., New York, N. Y.
French, Harry B.,
429 Arch st., Philadelphia, Pa.
French, John I.,
2 A, Park st., Boston, Mass.
Frerksen, Richard C.,
1201 W. North ave., Chicago, Ill.
Frohwein, Richard,
121 1st st., Elizabethport, N. J.
Frost, Wm. A.,
Selby & Western aves., St. Paul, Minn.
Frye, Geo. C.,
320 Congress st., Portland, Me.
FULLER, OLIVER F.,
220 Randolph st., Chicago, Ill.
Gale, Edwin O.,
85 S. Clark st., Chicago, Ill.
Gale, William H.,
82 S. Clark st., Chicago, Ill.
Gallagher, John C.,
466 Grove st., Jersey City, N. J.
Gamble, Stewart,
301 Hennepin ave., Minneapolis, Minn.
Gammon, Irving P.,
150 Dudley st., Boston, Mass.
Gane, Eustace H.,
91 Fulton st., New York, N. Y.
Gano, William H.,
1634 Columbia ave., Philadelphia, Pa.
Gardner, Robert W.,
158 William st., New York, N. Y.
Gaus, Charles H.,
202 Washington ave., Albany, N. Y.
Gayle, John W.,
Ann & Market sts., Frankfort, Ky.
Geisler, Joseph F.,
6 Harrison st., New York, N. Y.
GEORGE, CHARLES T.,
1306 N. 3d st., Harrisburg, Pa.
Gessner, Emil A.,
301 Chapel st., New Haven, Conn.

Getty, Wilmot S.,
348 Robert st., St. Paul, Minn.
Gill, George,
164 S. 4th ave., Mt. Vernon, N. Y.
Gilpin, Henry B.,
Light & Lombard sts., Baltimore, Md.
Gleghorn, James S.,
1027 Morrison ave., Allegheny, Pa.
Gleim, John C.,
301 Superior st., Cleveland, O.
Glick, Harry E.,
526 N. 9th st., Lafayette, Ind.
Glover, William H.,
591 Essex st., Lawrence, Mass.
Godbold, Fabius C.,
2728 Prytania st., New Orleans, La.
Godding, John G.,
278 Dartmouth st., Boston, Mass.
Golden, Lee H ,
McLoud, Okla. Ter.
Goldmann, Oscar,
2126 3d ave., New York, N. Y.
Goldsborough, Charles H.,
Lynchburg, Va.
Good, James M.,
2348 Olive st., St. Louis, Mo.
Goodale, Harvey G.,
P. O. Box 2, Jamaica, Queens Co., N. Y.
Goodwin, William W.,
Newburyport, Mass.
Gordin, Harry M.,
2238 Kemper lane, Wal't Hills, Cincinnati, O.
Gordon, Frederick T.,
Hospital Steward, Navy Yard, League Is., Pa.
Gordon, William J. M.,
710 Plum st., Cincinnati, O.
Gorgas, George A.,
6 Market Square, Harrisburg, Pa.
Gosman, Adam J.,
Charles & Mulberry sts., Baltimore, Md.
Grace, Wm. D.,
14 Market Square, Portsmouth, N. H.
Graham, Clarence M.,
Hospital Steward, U. S. S. Iris, Manila, P. I.
Graham, Frank R.,
P. O. Box 123, Mercer, Mercer Co., Pa.
Grambois, Augustin,
1091 Esplanade ave., New Orleans, La.
Grandjean, Eugene,
2828 N. 14th st., St. Louis, Mo.
Grassly, Charles W.,
287 W. 12th st., Chicago, Ill.
Gray, Henry R.,
122 St. Lawrence Main st., Montreal, Can.
Gray, William,
857 Fulton st., Chicago, Ill.
Green, Benjamin,
12 Market Square, Portsmouth, N. H.
Greene, Lester H.,
25 State st., Montpelier, Vt.
Greene, William R.,
1 Westminster st., Providence, R. I.
Greer, Samuel R.,
Pittsburg, Tex.
Gregorius, George,
421 8th ave., New York, N. Y.
Gregory, Willis G.,
530 Main st., Buffalo, N. Y.
Greiner, William E.,
104 N. Side Sq., Paris, Tex.
Greve, Charles M.,
6th & Market sts., Chattanooga, Tenn.
Greyer, Julius,
Vine & Findlay sts., Cincinnati, O.
Griffith, Chas.,
501 Main st., Johnstown, Pa.
Gross, Chas. E.,
14th & Park sts. N. W., Washington, D. C.
Gross, Edward Z.,
119 Market st., Harrisburg, Pa.
Grossjohann, Ernst,
Hospital Steward, U.S.A., Warrington, Fla.
Grossklaus, John F.,
High st. & Public Square, Navarre, O.
Guerin, James F.,
236 Front st., Worcester, Mass.
Guise, P. Nettleton,
U. S. N. Hospital, Philadelphia, Pa.
Gundrum, George,
Ionia, Mich.
Haake, William H.,
795 Central ave., Cleveland, O.
Hall, Edwin B.,
173 Main st., Wellsville, Allegheny Co., N. Y.
Hall, Horace B.,
Main & Commerce sts., Fredericksburg, Va.
Hall, Joseph P.,
17 Washington sq., Suffolk, Va.
Hall, Robert E. L.,
301 Gorsuch ave., Baltimore, Md.
Hall, William A.,
177 Griswold st., Detroit, Mich.
Hallberg, Carl S. N.,
358 Dearborn st., Chicago, Ill.

Hammar, Alrik.
c. o. Navy Department, Washington, D. C.
Hammel, Joseph, Medford, Wis.
HANCE, EDWARD H.,
Callowhill & Marshall sts., Phila., Pa.
Hancock, Chas. W.,
Langhorne, Pa.
Hancock, Franklin W.,
Oxford, N. C.
HANCOCK, JOHN F.,
4 S. Howard st., Baltimore, Md.
Hannan, Owen B.,
693 Cedar ave., Cleveland, O.
Harbaugh, Wilson L.,
Haverford, Montgomery Co., Pa.
Hardin, John H.,
124 Front st., Wilmington, N. C.
HARLOW, NOAH S.,
4 Smith's Block, Bangor, Me.
Harper, Robert N.,
609 Penna. ave., Washington, D. C.
Harrington, Frank,
Main & Market sts., Logan, O.
Harris, Francis M.,
814 Main st., Worcester, Mass.
Harrison, Richard H. M.,
Broad & Foushee sts., Richmond, Va.
Harrison, Robtert L.,
607 Louisiana st., Richmond, Va.
Harrison, William J.,
Main st. & Clifton ave., Lakewood, N. J.
Harter, Isaac F., Stronghurst, Ill.
Hartnett, Eugene,
105 Montgomery st., Jersey City, N. J.
Hartshorn, Frederick A.,
15 Mechanics' st., Marlborough, Mass.
Hartwig, Otto J.,
1570 Milwaukee ave., Chicago, Ill.
Hassebrock, Henry F.,
1901 Wright st., St. Louis, Mo.
Hassinger, Samuel E. R.,
Fairmount ave. & 23d st., Philadelphia, Pa.
Hatton, Edgar M.,
Hotel Vendome, Capitol Sq., Columbus, O.
Hatton, Ellmore W.,
90 N. High st., Columbus, O.
Hauenstein, William,
375 Amsterdam ave., New York, N. Y.
Haussamen, Henry L.,
Grafton, N. Dak.
Haussmann, Frederick W.,
1627 N. 8th st., Philadelphia, Pa.
Havenhill, L. D.,
1324 Tennessee st., Lawrence, Kan.
Haviland, Henry,
152 Prospect Park, W. Brooklyn, N. Y.
Hay, Chas. L.,
209 Du Bois ave., Du Bois, Pa.
Hay, Edward A.,
Middle & Free sts., Portland, Me.
Hayes, Horace P.,
312 Elk st., Buffalo, N. Y.
Hayes, James H.,
305 Sumner st., E. Boston, Mass.
Haynes, David O.,
396 Broadway, New York, N. Y.
Hays, Joseph A.,
147 S. 18th st., Pittsburg, Pa.
Hazlett, James L.,
Hearne, Robertson Co., Tex.
Hechler, George L.,
1099 Broadway, Cleveland, O.
Hedley, Thomas A.,
137 Pearl st., Boston, Mass.
Heebner, Charles J.,
Ontario Coll. Pharm., Toronto, Can.
Heim, Henry,
James & 3d sts., Saginaw, E. S., Mich.
Heinemann, Otto,
Laurel & Linn sts., Cincinnati, O.
Heinitsh, Sigmund W.,
16 E. King st., Lancaster, Pa.
Heintzelman, Joseph A.,
Ridge & College aves., Philadelphia, Pa.
Helfman, Joseph,
82 E. Montcalm st., Detroit, Mich.
Heller, Chas. T.,
33 W. 10th st., St. Paul, Minn.
Hemm, Francis,
2730 Osage st., St. Louis, Mo.
Hemm, Louis P.,
Webster & Jefferson aves., Kirkwood, Mo.
Henderson, Archibald K.,
300 Frankstown ave., Pittsburg, Pa.
Hengst, J. Edwin,
Gay st. & Central ave., Baltimore, Md.
Henry, Charles (Dworniczak),
Croton-on-Hudson, N. Y.
Henry, Charles L.,
610 F. st. N. E., Washington, D. C.
Henry, Frank C.,
703 15th st. N. W., Washington, D. C.
Hepburn, John,
103 Main st., Flushing, N. Y.

Herbst, William P.,
2500 Penna. ave. N. W., Washington, D. C.
Hereth, Frank S.,
314 Belden ave., Chicago, Ill.
Heschong, John F.,
1016 N. Adams st., Peoria, Ill.
Hess, Paul L.,
Independence&Forest aves.,KansasCity,Mo.
Heydenreich, Emile,
30 N. William st., New York, N. Y.
Heyl, James E.,
Vice-Consul, Hamilton, Bermuda.
Hickerson, William H.,
Warren, Huntingdon Co., Ind.
Hicks, Henry T.,
101 Fayetteville st., Raleigh, N. C.
Higby, Wm. H.,
Ottawa, Ill.
Higgins, Albert W.,
19 Merchants' Row, Rutland, Vt.
Hill, Frederick J.,
80 W. 2d South st., Salt Lake City, Utah.
Hilton, Samuel L.,
1033 22d st. N. W., Washington, D. C.
Hinrichs, Gustavus D.,
4106 Shenandoah ave., St. Louis, Mo.
Hiriart, Sebastian,
Bank & Plaquemine sts., Plaquemine, La.
Hirseman, Felix,
1168 Ogden ave., New York, N. Y.
Hitchcock, John E.,
Custom House Sq., Plattsburg, N. Y.
Hoch, Aquila,
541 E. Thompson st., Philadelphia, Pa.
Hogan, John J.,
90 Meadow st., New Haven, Conn.
Holliday, Francis E.,
523 Kansas ave., Topeka, Kan.
Holmes, Clay W.,
410 W. Gray st., Elmira, N. Y.
Holmes, Henry E.,
Seattle, Wash.
Holzhauer, Charles,
787 Broad st., Newark, N. J.
Hood, Charles L.,
Merrimac & Central sts., Lowell, Mass.
Hopkins, Jesse L.,
100 William st., New York, N. Y.
Hopkins, Zerah B.,
Brandon, Vt.
Hopp, Lewis C.,
198 Euclid ave., Cleveland, O.
Horn, Wilbur F.,
32 West Main st., Carlisle, Pa.
Houghton, E. Mark,
270 Woodward ave., Detroit, Mich.
Hover, William A.,
1437 Lawrence st., Denver, Colo.
Howard, Fletcher,
Des Moines, Ia.
Howell, Edward V.,
Chapel Hill, N. C.
Howey, John J.,
88 Fort st., Montreal, Can.
Howson, Arthur B.,
Paint & Main sts., Chillicothe, O.
Huder, Henry J.,
52 E. Washington st., Indianapolis, Ind.
Hudnut, Richard A.,
925 Broadway, New York, N. Y.
Hudson, Arthur,
Centre st., Newton, Mass.
Huested, Alfred B.,
77 Eagle st., Albany, N. Y.
Huhn, Charles H.,
208 Western ave., Minneapolis, Minn.
Huhn, George,
Care Ger. Amer. Bank, Minneapolis, Minn.
Humma, Henry J.,
Metropolis, Ill.
Huntington, William H.,
U. S. Naval Sta., Newport, R. I.
Hurd, John C.,
26 Market st., Somersworth, N. H.
Hurlebaus, George W.,
2030 14th st. N. W., Washington, D. C.
Hurty, John N.,
104 N. Penn st., Indianapolis, Ind.
Huston, Charles,
47 S. High st., Columbus, O.
Hutton, Harry D.,
1033 22d st. N. W., Washington, D. C.
Hydren, Carl,
223 North st., Pittsfield, Mass.
Hynson, Henry P.,
423 N. Charles st., Baltimore, Md.
Ink, Charles E.,
Columbiana, O.
Ires, Orvin F.,
853 Main st., Hartford, Conn.
Jackman, Wilbur F.,
Orono, Me.
Jackson, Frank A.,
90 Main st., Woonsocket, R. I.

Jackson, William J.,
44 Third st., San Francisco, Cal.
Jacobs, Joseph,
6 & 8 Marietta st., Atlanta, Ga.
JACQUES, GEORGE W.,
Broadway & Augusta st., S. Amboy, N. J.
Jelliffe, Smith E.,
231 W. 71st st., New York, N. Y.
Jenkins, W. Edgar,
714 N. Arlington ave., Baltimore, Md.
Jenks, William J.,
4043 Market st., Philadelphia, Pa.
Jesson, Jacob,
Euclid ave., Ontario, Cal.
Joergensen, Sophus,
Commercial st., La Conner, Skagit Co., Wash.
Joerger, Frederick,
Brunswick, Glynn Co., Ga.
Johnson, Chas. B.,
54 Third st., Middletown, O.
Johnson, D. Dudley,
Concord, N. C.
Johnson, Joseph H.,
Arcanum, O.
Johnson, Louise L. (Mrs.),
Wall st., Jasper, Minn.
Johnston, Henry A.,
1221 New Jersey av. N.W., Washington, D.C.
Jones, Alexander H.,
9th & Parrish sts., Philadelphia, Pa.
Jones, David F.,
Watertown, S. Dak.
Jones, James T.,
855 E. 4th st., South Boston, Mass.
Jones, Simon N.,
1st & Jefferson sts., Louisville, Ky.
Jorgensen, Hans C.,
U. S. S. Yankton, Gibara, Cuba.
Joy, Edwin W.,
California & Kearney sts., San Francisco, Cal.
Jungmann, Julius,
1020 3d ave., New York, N. Y.
Kaemmerer, Wm. F.,
410 S. 6th st., Columbus, O.
Kaenter, Frederick W.,
4629 Easton ave., St. Louis, Mo.
Kalish, Julius,
413 Grand st, New York, N. Y.
Kalish, Oscar G.,
23d st. & 4th ave., New York, N. Y.
Kammer, D. Alexander,
Myrtle ave. & Lanvale st., Baltimore, Md.
Karn, William A.,
423 Dundas st., Woodstock, Ont., Can.
Kauffman, George B.,
235 N. High st., Columbus, O.
Keaney, James J.,
Charles & West sts., Malden, Mass.
Kebler, Lyman F.,
35 Poplar st., Philadelphia, Pa.
Keefer, Charles D.,
Main & Queen sts., Chambersburg, Pa.
Keenan, Thomas J.,
66 W. Broadway, New York, N. Y.
Keeney, Caleb R.,
16th & Arch sts., Philadelphia, Pa.
Kelley, Edward S.,
392 Boylston st., Boston, Mass.
Kelly, John I.,
1542 N. Broadway, Baltimore, Md.
Kemp, Edward,
68 William st., New York, N. Y.
Kennedy, Ezra J.,
396 Broadway, New York, N. Y.
Kennedy, George W.,
103 N. Centre st., Pottsville, Pa.
Kent, Henry A., Jr.,
Park Drug Store, Elizabeth, N. J.
Kent, Robert R.,
220 W. 70th st., New York, N. Y.
Keppler, Christian L.,
1632 Dryades st., New Orleans, La.
Kerr, William W.,
Batesville, Ark.
Kettler, Edward, Jr.,
Farwell ave. & Brady st., Milwaukee, Wis.
Kiedaisch, John F., Jr.,
1028 Main st., Keokuk, Ia.
Kienth, Hans,
608 Mitchell st., Milwaukee, Wis.
Kilmer, Frederick B.
17 Codnise ave, New Brunswick, N. J.
Kimball, Richard H.,
206 Park st., Hartford, Conn.
King, Campbell T.,
Cotton ave. and Mulberry st., Macon, Ga.
King, George A. N.,
100 Washington ave., Minneapolis, Minn.
KING, JAMES T.,
Main & South sts., Middletown, N. Y.
Kirchgasser, William C.,
74 Laight st., New York, N. Y.
Kirk, James E.,
101 Main st., Jacksonville, Fla.

Kirkland, Derwentwater,
320 S. Spring st., Los Angeles, Cal.
Klein, Ernst F.,
218 Central ave., Hot Springs, Ark.
Klein, Frederick,
323 W. Madison st., Chicago, Ill.
Klie, G. H. Charles,
5100 N. Broadway, St. Louis, Mo.
Kline, Mahlon N.,
427 Arch st., Philadelphia, Pa.
Klor, Alex. E. G.,
2601 Washington ave., Newport News, Va.
KLUSSMANN, HERMANN,
110 First st., Hoboken, N. J.
Knabe, Gustavus A.,
Court Square & Dexter av., Montgomery, Ala.
Knight, William C.,
P. O. Box 819, Carrollton, Mo.
Knoebel, Thomas,
209 Collinsville ave., East St. Louis, Ill.
Knoefel, Bruno,
394 E. Spring st., New Albany, Ind.
Knoefel, Charles D.,
110 E. Market st., New Albany, Ind.
Knox, James W. T.,
242 Bellevue ave., Detroit, Mich.
Koch, John A.,
708 Hampshire st., Quincy, Ill.
Koch, Julius A.,
Bluff & Pride sts., Pittsburg, Pa.
Koch, Louis,
329 N. 4th st., Philadelphia, Pa.
Kolb, William W.,
M. H. S., Savannah Quarantine, Ga.
Kornmann, Henry,
831 Harlem ave., Baltimore, Md.
Kraemer, Henry,
145 N. 10th st, Philadelphia, Pa.
Krause, John,
789 Woodland ave., Cleveland, O.
Kremers, Edward,
Univ. of Wisconsin, Madison, Wis.
Krewson, William E.,
1822 Franklin st., Philadelphia, Pa.
Krick, Charles A.,
Hosp. Steward, care War Dept., Wash., D.C.
Krieger, Philip,
Tompkins ave., cor. Myrtle, Brooklyn, N. Y.
Krueger, Owen W.,
5th & Broadway, Kansas City, Mo.
Kuder, William F.,
342 Jennings ave., Cleveland, O.
Kuhn, Norman A.,
124 S. 15th st., Omaha, Neb.
La Grange, John V. N.,
U. S. N. Hospital, Mobile, Ala.
La Pierre, Elie H.,
96 River st., Cambridgeport, Mass.
La Wall, Charles H.,
35 Poplar st., Philadelphia, Pa.
Lachance, Seraphin,
1538 St. Catharine st., Montreal, Can.
Laing, Alfred A.,
273 Pearl st., Cambridgeport, Mass.
Laird, John,
Diamond P. O., Ark.
Lamar, Henry J.,
510 Forsyth st., Vineville, Macon, Ga.
Lampa, Robert R.,
128 William st, New York, N. Y.
Lanctot, Henri,
299½ St. Lawrence st., Montreal, Can.
LAND, ROBERT H.,
812 Broad st., Augusta, Ga.
Lariviere, Telesphore,
1101 Adams st., N. E., Minneapolis, Minn.
Larrabee, John,
506 Main st., Melrose, Mass.
Latin, George,
32 S. Main st., Dayton, O.
Lauricella, Felice,
275 Hanover st., Boston, Mass
Layton, Thomas,
2743 N. Grand ave., St. Louis, Mo.
LEE, JAMES A.,
Main st., New Iberia, La.
Legel, John G.,
Charles City, Ia.
Legendre, Joseph A.,
201 Dauphine st., New Orleans, La.
Lehman, Louis,
1231 N. Halstead st., Chicago, Ill.
Lehr, Philip,
1145 Lorain st., Cleveland, O.
Leis, George,
747 Massachusetts st., Lawrence, Kan.
Leitch, Arthur,
Residence unknown.
LEMBERGER, JOSEPH L.,
5 N. Ninth st., Lebanon, Pa.
Lernhart, August,
P. O. Box 10, Centreville, Alameda Co., Cal.
Leverty, John A.,
837 Main st., Bridgeport, Conn.

Levinson, Joseph,
11 Main st., Napa, Cal.
Levy, Adolph,
145 Grand st., E. D., Brooklyn, N. Y.
Levy, William M.,
420 Magazine st., New Orleans, La.
Lewis, Ernest G.,
701 Centre st., Jamaica Plain, Mass.
Libby, Henry F.,
Main st., Pittsfield, Me.
Ligon, J. Temple,
P. O. Box 231, Anderson, S. C.
Lillie, Foress B.,
204 Harrison ave., Guthrie, Okla. Ter.
Lilly, Josiah K.,
Indianapolis, Ind.
Lincoln, George W.,
1610 Master st., Philadelphia, Pa.
Lindeman, Harry F.,
1100 Hanover st., Baltimore, Md.
Lindvall, Gus.,
15th st. & 5th ave., Moline, Ill.
LLEWELLYN, JOHN F.,
Public Square, Mexico, Audrain Co., Mo.
LLOYD, JOHN U.,
Court & Plum sts., Cincinnati, O.
Lockert, Charles L.,
96 Franklin st., Clarksville, Tenn.
Lockie, James A.,
1128 Main st., Buffalo, N. Y.
Loehr, Theodore C.,
Carlinville, Macoupin Co., Ill.
Lohmann, Herman J.,
90 Monticello ave., Jersey City, N. J.
Lohmeyer, Henry L.,
1901 Carson st., Pittsburg, Pa.
Loomis, John C.,
Chestnut & Watt sts., Jeffersonville, Ind.
Lord, Frank J.,
1101 Larimer st., Denver, Col.
Lord, Thomas,
72 Wabash ave., Chicago, Ill.
Louis, Leopold G.,
Med. Dept., Navy Yard, New York, N. Y.
Lovis, Henry C.,
2137 7th ave., New York, N. Y.
Lovvorn, James L.,
Bowdon, Ga.
Lowd, John C.,
43 Temple Place, Boston, Mass.
Lowe, Clement B.,
Phil-Ellena st. & Germant'n ave., Phila., Pa.
Lowe, John W.,
532 Howard ave., New Haven, Conn.
Lowell, Edward M.,
19 Hammond st., Lewiston, Me.
Lueder, Fritz,
511 S. Adams st., Peoria, Ill.
Lundberg, John C.,
Halstead & Harrison sts., Chicago, Ill.
Lynch, Frank K.,
87 Hampshire st., Cambridge, Mass.
Lynch, Robert F.,
Monticello, Wright Co., Minn.
Lyon, George C.,
225 Westminster st., Providence, R. I.
Lyons, Albert B.,
72 Brainard st., Detroit, Mich.
Lyons, Fred. W.,
464 Bergen ave., Jersey City, N. J.
Lyons, Isaac L.,
42 Camp st., New Orleans, La.
MacRae, John Y.,
P. O. Box 66, Norfolk, Va.
Macnair, Whitmel H.,
Main st., Tarboro, N. C.
Macy, Sherman R.,
Highland Park Normal Coll., Des Moines, Ia.
Maguire, Eduord S.,
U.S.M.Hosp., Stapleton, Staten Island, N.Y.
Main, Thomas F.,
278 Greenwich st., New York, N. Y.
Maisch, Henry,
711 Edmondson ave., Baltimore, Md.
Maisch, Henry C. C.,
2637 Aspen st., Philadelphia, Pa.
Majer, Oscar,
400 S. 2d st., Clinton, Ia.
Major, John R.,
800 7th st., Washington, D. C.
Mallinckrodt, Edward,
Mallinckrodt & Main sts., St. Louis, Mo.
Manning, John H.,
163 North st., Pittsfield, Mass.
Mansfield, Samuel,
1001 W. Baltimore st., Baltimore, Md.
Maphis, Charles G.,
106 E. Main st., Charlottesville, Va.
Mares, Ferdinand L.,
20th & Pierce sts., Omaha, Neb.
Markoe, George B.,
707 Washington st., Boston, Mass.
Marshall, Ernest C.,
157 Bunker Hill st., Charlestown, Mass.

Martin, John C.,
U. S. Nav. Dispensary, Washington, D. C.
Martin, Nicholas H.,
RavenswoodL.Fell,Gateshead-on-Tyne,Eng
Mason, Harry B.
232 McDougall ave., Detroit, Mich.
Massey, William M.,
1129 Broadway, New York, N. Y.
Massie, Paul,
109 Jefferson st., Roanoke, Va.
Matson, Geo. H., Jr.
662 E. Long st., Columbus, O.
Matthews, Charles E.,
221 Randolph st., Chicago, Ill.
Matusow, Harry,
1615 N. 6th st., Philadelphia, Pa.
May, Charles C.,
3341 Lucas ave., St. Louis, Mo.
May, Edward,
U.S.S.Montg'y,Navy Dep.,Washington,D.C.
May, Eugene.
Canal & Chartres st., New Orleans, La.
May. James O.,
Water st., Naugatuck, Conn.
Mayo, Caswell A.,
66 West Broadway, New York, N. Y.
McClearn, Henry T.,
Boothbay Harbor. Me.
McConnell, Chas. H.,
84 State st., Chicago, Ill.
McConville, Thomas A.,
Residence Unknown.
McDonald, George,
Main & Burdick sts., Kalamazoo, Mich.
McElhenie, Thomas D.,
259 Ryerson st., Brooklyn, N. Y.
McGeorge. William,
Metropolitan ave. & 2d st., Argentine, Kan.
McGill, John T.,
Vanderbilt University, Nashville, Tenn.
McIntyre, Byron F.,
91 Fulton st., New York, N. Y.
McIntyre, Ewen,
303 W. 74th st., New York, N. Y.
McIntyre, William,
2429 Frankford ave., Philadelphia, Pa.
McKesson, G. Clinton,
91 Fulton st., New York, N. Y.
McKesson, John, Jr.,
91 Fulton st., New York, N. Y.
McKinney, Robert S.,
Taneytown, Md.
McLarty, Colin,
Navy Yard Dispensary, Norfolk, Va.
McMahon, Joseph,
38½ Clermont ave., Brooklyn, N. Y.
McMonies, Thomas L.,
1093 Osgood st., Chicago, Ill.
McPherson, George,
Residence Unknown.
Mead, Nehemiah P.,
Akron, Ia.
Mehl, Henry W.,
5th & Delaware sts., Leavenworth, Kan.
Meisburger, William J.,
Webster Groves, Mo.
Meissner, F. W., Jr.,
820 Main st., La Porte, Ind.
Mellor Alfred,
218 N. 22d st., Philadelphia, Pa.
Menk, Charles W.,
106 Market st., Newark, N. J.
Mennen, Gerhard,
577 Broad st., Newark, N. J.
Meredith, H. Lionel,
319 Washington st., Hagerstown, Md.
Merrell, Ashbel H.,
1021 6th ave. W., Topeka, Kan.
Merrell, Charles G.,
6th st. & Eggleston ave., Cincinnati, O.
Merrell, George,
6th st. & Eggleston ave., Cincinnati, O.
Metz, Abraham L.,
Prytania st., New Orleans, La.
MEYER, CHRISTIAN F. G.,
4th st. & Clark ave., St. Louis, Mo.
Meyer, Martin M.,
118 N. Main st., South Bend, Ind.
Michaelis, Gustavus,
1 Myrtle ave., Albany, N. Y.
Michalek, John,
1616 Otto Boulevard, Chicago Heights, Ill.
MILHAU, EDWARD L.,
183 Broadway, New York, N. Y.
Millard, David R.,
2200 E. Baltimore st., Baltimore, Md
MILLER, ADOLPH W.,
3d & Callowhill sts., Philadelphia, Pa.
Miller, Charles,
U. S. M. Hospital, Stapleton, S. I., N. Y.
Miller, Chas. E.,
U. S. S. Prairie, New York, N. Y.
Miller, Emerson R.,
Polytechnic Inst., Auburn, Ala.

Miller, Herman,
U. S. A., Benicia Barracks, Cal.
Miller, Jacob A.,
2d & Chestnut sts., Harrisburg, Pa.
Miller, T. Ashby,
519 E. Broad St., Richmond, Va.
Miller, Wm. H.,
New Philadelphia, O.
Milligan, Decatur,
509 N. 2d st., Philadelphia, Pa.
Milligan, John D.,
U.S.S.FishHawk,c.o.FishCom'n,Wash.,D.C.
Miner, Maurice A.,
2421 Dearborn st., Chicago, Ill.
Mittelbach, William,
114 Main st., Boonville, Mo.
Mix, Willis L.,
871 Chapel st., New Haven, Conn.
Moerk, Frank X.,
2510 Brown st., Philadelphia, Pa.
Moffit, Thomas S.,
1617 Sacramento st., San Francisco, Cal.
Moith, Augustus T.,
1 Ferry st., Fishkill, N. Y.
Molwitz, Ernest,
2707 8th ave., New York, N. Y.
MOORE, GEORGE,
26 Market st., Somersworth, N. H.
MOORE, JOACHIM B.,
13th & Lombard sts., Philadelphia, Pa.
Moore, John T.,
1012 Rhode Island st., Lawrence, Kan.
Moore, Josh F.,
4th st., Meridian, Miss.
Moore, Silas H.,
525 4th st., Sioux City, Ia.
Morgan, Aylmer L.,
Washington & Adams sts., Camden, Ark.
Morgan, Charles,
1300 N. Caroline st., Baltimore, Md.
Morison, J. Louis D.,
145 N. 10th st., Philadelphia, Pa.
Morris, Lemuel L.,
720 N. Broad st., Philadelphia, Pa.
Morris, Max,
503 4th st., Macon, Ga.
Morrison, Joseph E.,
P. O. Box 683, Montreal, Can.
Morse, Edward W.,
Townly Park, Mt. Vernon, Ill.
Mosher, William W.,
13 Colony st., Meriden, Conn.
Moulton, Daniel P.,
213 Lisbon st., Lewiston, Me.
Mueller, Adolphus,
Cherry st., Highland, Ill.
Mueller, Ambrose,
Bristol Bldg., Webster Groves, Mo
Muench, Wm.,
608 N. Salina st., Syracuse, N. Y.
Mulcahy, Daniel D.,
831 N. Capitol st., Washington, D. C.
Mulford, Henry K.,
412 S. 13th st., Philadelphia, Pa.
Mumma Edgar,
220 S. Jonathan st., Hagerstown, Md.
Murphy, John P.,
Main st., North Andover, Mass.
Murphy, John S.,
Union Block, Pontiac, Ill.
Murray, Benjamin L.,
Care Merck & Co., New York, N. Y.
Muth, George L.,
15 E. Fayette st., Baltimore, Md.
Muth, John C.,
15 E. Fayette st., Baltimore, Md.
Muth, John S.,
15 E. Fayette st., Baltimore, Md.
Myers, Daniel,
111 Water st., Cleveland, O.
Myers, Preston B.,
1523 Farnum st., Omaha, Neb.
Nattans, Arthur,
S. E. cor. Lexington & Howard sts., Balt., Md.
Neal, Chas. C.,
429 Main st., Danville, Va.
Neeley, Guy M.,
254 11th st. S. E., Washington, D. C.
Newman, George A.,
5th & Walnut sts., Louisville, Ky.
Newton, Philo W.,
142 Asylum st., Hartford, Conn.
Nichols, John C.,
119 State st., New London, Conn.
Nichols, Thomas B.,
178 Essex st., Salem, Mass.
Nicholson, Edgar L.,
1443 Holly st., New Whatcom, Wash.
Nielson, John,
Ortonville, Minn.
Nipgen, John A.,
Paint & 2d sts., Chillicothe, O.
Nixon, Charles F.,
Leominster, Mass.

Noll, Martin J.,
925 Goodfellow ave., St. Louis, Mo.
Nordmann, Herman,
1231 E. Preston st., Baltimore, Md.
Norton, George E.,
223 Putnam ave., Cambridgeport, Mass.
O'Gorman, Theophilus V.,
U. S. M. Hospital, Louisville, Ky.
O'Hare, James,
6 Benefit st., Providence, R. I.
O'Neill, Henry M.,
463 Hudson st., New York, N. Y.
Oberdeener, Samuel,
Franklin st., Santa Clara, Cal.
Ogier, John M.,
816 Wheeling ave., Cambridge, O.
Ohliger, Lewis P.,
23 West Liberty st., Wooster, O.
Oldberg, Oscar,
2421 Dearborn st., Chicago, Ill.
Oleson, Olaf M.,
Fort Dodge, Ia.
Oliff, James H.,
200 Arlington ave., Plainfield, N. J.
Oliver, William M.,
132 Broad st., Elizabeth, N. J.
Orne, Joel S.,
493 Main st., Cambridgeport, Mass.
Orton, Ingomar F.,
13th st., Galveston, Tex.
Osmun, Charles A.,
13 7th ave., New York, N. Y.
Osseward, Cornelius,
c.o.Stewart&Holmes DrugCo.,Seattle,Wash.
Otis, Clark Z.,
63 Court st., Binghamton, N. Y.
Ottinger, James J.,
20th & Spruce sts., Philadelphia, Pa.
Otto, John N. W.,
76 S. Rampart st., New Orleans, La.
Otto, Theodor G. E.,
402 Washington st., Columbus, Ind.
Owens, Richard J.,
Myrtle ave. & Spencer st., Brooklyn, N. Y.
Paine, Charles J.,
Waycross, Ga.
Parisen, Allen C.,
Broadway & David st., South Amboy, N. J.
Parisen, George W.,
Smith & High sts., Perth Amboy, N. J.
Parsons, Chas. W.,
396 Broadway, New York, N. Y.
Parsons, John,
194 31st st.. Chicago, Ill.
Partridge, Charles K.,
Granite Block, Augusta, Me.
Partridge, Frank R.,
Water st., Augusta, Me.
Patch, Edgar L.,
P. O. Box 639, Stoneham, Mass.
Patrick, Elmer A.,
615 Main st., Sharpsburg, Pa.
Patten, I. Bartlett,
594 Washington st., Boston, Mass.
Patterson, Theodore H.,
3640 Cottage Grove ave., Chicago, Ill.
Pattison, George H.,
88 S. Market st., Chicago, Ill.
Patton, John F.,
237 W. Market st., York, Pa.
Pauley, Frank C.,
Eastern st. & Compton ave., St. Louis, Mo.
Payne, George F.,
43½ Whitehall st., Atlanta, Ga.
Peabody, William H.,
8 S. Division st., Buffalo, N. Y.
Peacock, Bertha L.,
2012 S. 10th st., Philadelphia, Pa.
Peacock, Josiah C.,
2012 S. 10th st., Philadelphia, Pa.
Pearce, Howard A..
370 Elmwood ave., Providence, R. I.
Pearman, Wm. E.,
U.S.T.S.Pensacola,Sta.D,San Francisco,Cal.
Pearson, Joseph F.,
U. S. S. Bennington, San Francisco, Cal.
Pease, Autumn V.,
Fairbury, Neb.
Pease, Francis M.,
Main st., Lee, Mass.
Peck, George L.,
Hall of Pharmacy, Jamaica, N. Y.
Pennock, Edward,
13 W. Saratoga st.. Baltimore, Md.
Perkins, Benjamin A.,
94 Commercial st., Portland, Me.
Perkins, C. William,
1 East Main st., Waterbury, Conn.
Perot, T. Morris,
1810 Pine st., Philadelphia, Pa.
Perry, Frederick W. R.,
709 Woodward ave., Detroit, Mich.
Peter, Minor C.,
832 Sixth st., Louisville, Ky.

Peters, John M.,
100 William st., New York, N. Y.
Peterson, J. Otto,
1501 Washington ave. S.,Minneapolis,Minn.
Petsche, Bismarck Wm.,
Arlington Chemical Co.. Yonkers, N. Y.
PETTIT, HENRY M.,
15 S. Main st., Carrollton, Mo.
Pfaff, Franz,
871 Boylston st., Boston, Mass.
Pfafflin, Henry A,,
Asheville, N. C.
Pfeiffer, John,
317 W. Commerce st., San Antonio, Tex.
PFINGST, FERDINAND J.,
217 W. Broadway, Louisville, Ky.
Phillips, Carrie Elizabeth,
17 Wyeth st., Cambridge, Mass.
Phillips, Charles W.,
484 Eastern ave., Cincinnati, O.
Phillips, Edwin F.,
4 E. Main st., Armada, Mich.
Pickett, John H.,
Oskaloosa, Mahaska Co., Ia.
Pieck, Edward L.,
6th & Main sts., Covington, Ky.
Pierce, William H.,
316 Shawmut ave., Boston, Mass.
Pile, Gustavus,
770 Passyunk ave., Philadelphia, Pa.
Pilson, Abram O.,
1327 W. Baltimore st., Baltimore, Md.
Pine, Warren C.,
Riverside, Burlington Co., N. J.
Pitt, John R.,
218 Main st., Middletown, Conn.
Plaut, Albert,
128 William st., New York, N. Y.
Pleasants, Charles H.,
61 West Houston st., New York, N. Y.
Plenge, Henry.
8 Broad st., Charleston, S. C.
Porter, Chilton S.,
Somerset, Pulaski Co., Ky.
PORTER, HENRY C.,
Main & Pine sts., Towanda, Pa.
Porter, Millett N.,
3850 State st., Chicago Ill.
Portmann, Cæsar A.,
E. Las Vegas, N. Mex.
Potter, William R.,
100 Broad st., Providence, R. I.
Potts, David G.,
224 Market st., Philadelphia, Pa.
Powell, William C.,
Snow Hill, Md.
Powell, William D.,
Excello, Macon Co., Mo.
POWER, FREDERICK B.,
6 King st., Snow Hill, London, Eng.
Preissler, Henry W.,
Shelbyville, Ky.
Prescott, Albert B.,
University of Michigan, Ann Arbor, Mich.
Preston, Andrew P.,
2 Congress Block, Portsmouth, N. H.
Preston, David,
9th & Lombard sts., Philadelphia, Pa.
Price, Charles H.,
226 Essex st., Salem, Mass.
Price, Joseph,
226 Essex st., Salem, Mass.
Price, Roger T.,
Naval Hospital, Norfolk, Va.
Prieson, Adolph,
100 East Main st., Lock Haven, Pa.
Procter, Wallace,
1900 Pine st., Philadelphia, Pa.
Puckner, William A.,
73 Wells st., Chicago, Ill.
Punch, William F..
71 Dauphin st., Mobile, Ala.
Quackinbush, Benjamin F.,
703 Greenwich st., New York, N. Y.
Quandt, Arthur A ,
124 S. Howard st , Baltimore, Md.
Quandt, Ernest E.,
124 S. Howard st., Baltimore, Md.
Quayle, Thomas A.,
1966 Perdido st., New Orleans, La.
Raeuber, Edward G.,
44 Johnson st., Milwaukee, Wis.
Rains, A. Brown,
11 W. 7th st., Columbia, Tenn.
Ramaley, Francis,
University of Colorado, Boulder, Col.
RAMSPERGER, GUSTAVUS,
236 E. 23d st., New York, N. Y.
Rand, Daniel M.,
Main & Depot sts , S. Windham, Me.
Randall, Frank O.,
101 N. Main st., Brockton, Mass.
Rane, Charles O.,
1872 Niagara st., Buffalo, N. Y.

Rapelye, Charles A.,
853 Main st., Hartford, Conn.
Rauch, Henry,
1228 Main st., N. E., Minneapolis, Minn.
Rauschenberg, Sidney,
N. Y. Hospital, 15th st., New York, N. Y.
Rauschkolb, John,
251 S. 4th st., Columbus, O.
Ray, Peter W.,
379 S. 2d st., Brooklyn, N. Y.
Reade, Frank M.,
307 E. Grace st., Richmond, Va.
Redsecker, Jacob H.,
810 Cumberland st., Lebanon, Pa.
Reed, Willoughby H.,
Marshall & Astor sts., Norristown, Pa.
Reidy, Michael,
Shiawassee ave., Corunna, Mich.
REMINGTON, JOSEPH P.,
1832 Pine st., Philadelphia, Pa.
Reynolds, Charles E.,
U.S.R.S.Vermont,NavyYard,NewYork,N.Y.
Reynolds, Howard P.,
71 Washington ave., N., Plainfield, N. J.
Reynolds, John J.,
Water & Main Cross sts., Flemingsburg, Ky.
Rhode, Rudolph E.,
504 N. Clark st., Chicago, Ill.
Rhodes, Chas O.,
4 Main st., Groton, N. Y.
Rice, Charles,
Bellevue Hospital, New York, N. Y.
Richardson, Horatio S.,
Main st., Concord, Mass.
Richardson, Samuel W.,
U. S. Marine Hospital, St. Louis, Mo.
Richardson, Thomas L.,
211 W. 25th st., Baltimore, Md.
Richardson, Willard S.,
316 4½ st. S. W., Washington, D. C.
Riddell, Benjamin F.,
8 Granite Block, Fall River, Mass.
Ridgway, Lemuel A.,
Fillmore, Allegheny Co., N. Y.
Rittenhouse, Henry N.,
1705 N. 17th st., Philadelphia, Pa.
Robertson, Felix O.,
Searcy, White Co., Ark.
Robins, Wilbur F.,
28 Main st., Littleton, N. H.
Robinson, Edward A.,
19 Warwick st., Lowell, Mass.
Robinson, Ernest F.,
832 Yonge st., Toronto, Can.
ROBINSON, JAMES S.,
2d & Madison sts., Memphis, Tenn.
Robinson, Samuel L.,
Greene & Franklin sts., Baltimore, Md.
Robinson, William A.,
49 Drummond st., Auburn, Me.
Rockefeller, Howard,
653 W. Granite st., Butte, Mont.
Rockefeller, Lucius,
Palisade ave., Englewood, N. J.
Roe, William G.,
1034 7th st. N. W., Washington, D. C.
Rogers, Arthur H.,
Geneseo, Livingston Co., N. Y.
Rogers, Henry H.,
224 Court st., Kankakee, Ill.
Rogers, William H.,
North st., Middletown, N. Y.
Rohde, Claus F.,
Spring Valley, Minn.
Rollins, John F.,
7 Hamilton st., Dover, N. H.
Root, Wilfred F.,
67 Main st., Brattleboro, Vt.
Rosenthal, David A.,
Gay & Depot sts., Knoxville, Tenn.
Rosenzweig, Benj.,
624 Fulton st., Brooklyn, N. Y.
Roth, Charles R.,
333 E. Tuscarawas st., Canton, O.
Rowlinski, Robert A.,
104 Broughton st., Savannah, Ga.
Ruddiman, Edsel A.,
Vanderbilt Univ., Nashville, Tenn.
Ruenzel, Henry G.,
753 3d st., Milwaukee, Wis.
Rumsey, Samuel L.,
Fort & Hotel sts., Honolulu, H. I.
Runyon, Edward W.,
242 West 41st st., New York, N. Y.
Ruppert, John,
Price Hill, Cincinnati, O.
Rusby, Henry H.,
115 W. 68th st., New York, N. Y.
Ryan, Frank G.,
151 Joseph Campau ave., Detroit, Mich.
Sadtler, Samuel P.,
N. E. corner 10th & Chestnut sts., Phila., Pa.
Samson, Max,
111 Camp st., New Orleans, La.

Sanborn, George C.,
Northfield, Vt.
SANDER, ENNO,
129 S. 11th st., St. Louis, Mo.
Sargent, Ezekiel H.,
106 Wabash ave., Chicago, Ill.
Sauer, Louis W.,
927 Central ave., Cincinnati, O.
Sauerhering, Rudolph A.,
Main st., Mayville, Dodge Co., Wis.
SAUNDERS, WILLIAM,
Central Experim. Farm, Ottawa, Can.
Sawyer, Charles H.,
52 Main st., Saco, Me.
Sawyer, William F.,
1152 Tremont st., Boston, Mass.
Sayre, Edward A.,
Care of Seabury & Johnson, New York, N. Y.
Sayre, Lucius E.,
University of Kansas, Lawrence, Kan.
Sayre, William H.,
Warner & Orange sts., Newark, N. J.
Schaefer, Emil A.,
1436 Fifth ave., Pittsburg, Pa.
Schafer, George H.,
713 Front st., Fort Madison, Ia.
Schafhirt, Adolph J.,
1st & H sts., Washington, D. C.
SCHEFFER, HENRY W.,
Care of Larkin & Scheffer, St. Louis, Mo.
Schellentrager, Ernst A.,
1111 St. Clair st., Cleveland, O.
Scherer, Andrew,
383 N. State st., Chicago, Ill.
Scherff, John P.,
Glenwood & Wash'tn aves., Bloomfield, N. J.
Scherling, Gustav,
1201 4th st., Sioux City, Ia.
Schieffelin, William J.,
170 William st., New York, N. Y.
Schiemann, Edward B.,
M & Walnut sts., Louisville, Ky.
Schimpf, Henry W.,
372 W. 35th st., New York, N. Y.
Schlaepfer, Henry J.,
Main & 2d sts., Evansville, Ind.
Schley, Steiner,
16 W. Patrick st., Frederick City, Md.
Schlotterbeck, Augustus G.,
501 Congress st., Portland, Me.
Schlotterbeck, Julius O.,
548 Thompson st., Ann Arbor, Mich.
Schmid, Henry,
38 Ave. A., New York, N. Y.
Schmidt, Ferdinand T.,
533 Amsterdam ave., New York, N. Y.
Schmidt, Florian C.,
7123 Cottage Grove ave., Chicago, Ill.
Schmidt, Frederick M.,
1107 Schiller Building, Chicago, Ill.
Schmidt, Joseph H.,
2402 Cuming st., Omaha, Neb.
Schmidt, Oscar W.,
134 Lake st., Chicago, Ill.
Schmidt, Valentine,
Polk & Jackson sts., San Francisco, Cal.
Schmitt, George J. F.,
507 W. Commerce st., San Antonio, Tex.
Schmitter, Jonathan,
Maple st., Gypsum City, Saline Co., Kan.
Schneider, Albert,
2421 Dearborn st., Chicago, Ill.
Schoenhut, Christie H.,
199 Superior st., Cleveland, O.
Schoettlin, Albert J.,
4th & Chestnut sts., Louisville, Ky.
Schrader, August C.,
Elliot & Curley sts., Baltimore, Md.
Schrank, C. Henry,
437 E. Water st., Milwaukee, Wis.
Schreiner, Oswald,
1001 University ave., Madison, Wis.
Schueller, Frederick W.,
232 S. High st., Columbus, O.
Schuh, Paul G.,
607 Commercial ave., Cairo, Ill.
Schulze, Louis,
631 S. Patterson Park ave., Baltimore, Md.
Schumacher, Albert C.,
817 W. Huron st., Ann Arbor, Mich.
Schurk, Louis,
3201 Olive st., St. Louis, Mo.
Schweickhardt, Richard,
Olive & 28th sts., St. Louis, Mo.
Scott, George T.,
Franklin Square, Worcester, Mass.
Scott, Theodore W.,
U. S. S. Richmond, League Island, Pa.
Scott, William H.,
1617 17th st., Richmond, Va.
Scoville, Wilbur L.,
St. Botolph & Garrison sts., Boston, Mass.
SEABURY, GEORGE J.,
59 Maiden Lane, New York, N. Y.

Searby, William M.,
400 Sutter st., San Francisco, Cal.
Seinsoth, John J.,
11 Main st., Hartford, Conn.
Seltzer, Leonard A.,
Room 6, 32 Adams ave. W., Detroit, Mich.
Selzer, Eugene R.,
1492 Superior st., Cleveland, O.
Sempill, Walter M.,
135 Clark st., Chicago, Ill.
Sennewald, Emil A.,
800 Hickory st., St. Louis, Mo.
Serodino, Herman,
53 Observatory st., Cincinnati, O.
Sevin, N. Douglas,
141 Main st., Norwich, Conn.
Shafer, Ervin C.,
Green Lane & York Road, Philadelphia, Pa.
Shannon, Thomas R.,
143 Trumbull st., Hartford, Conn.
Sharp, Alpheus P.
Pratt & Howard sts., Baltimore, Md.
Sharples, Stephen P.,
13 Broad st., Boston, Mass.
Shaw, Robert J.,
3 E. Front st., Plainfield, N. J.
Sheehey, Henry L.,
219 E. Pecan st., Sherman, Tex.
SHEPPARD, SAMUEL A. D.,
1129 Washington st., Boston, Mass.
Sherman, Charles R.,
1513 Dodge st., Omaha, Neb.
Sherrard, Charles C.,
408 Concord ave., Detroit, Mich.
Sherwin, Eugene A.,
Ashland, Ore.
Sherwood, Henry J.,
979 Woodland ave., Cleveland, O.
SHINN, JAMES T.,
Broad & Spruce sts., Philadelphia, Pa.
Shoemaker, Richard M.,
4th & Race sts., Philadelphia, Pa.
Shreve, John A.,
Main st., Port Gibson, Miss.
Shurtleff, Israel H.,
39 Elm st., New Bedford, Mass.
Siegenthaler, Harvey N.,
22 E. High st., Springfield, O.
Sieker, Ferdinand A.,
128 William st., New York, N. Y.
Simmons, Frank B.,
182 Main st., Woonsocket, R. I.
SIMMS, GILES G. C.,
1344 New York ave., Washington, D. C.
Simon, William,
1348 Block st., Baltimore, Md.
Simonson, William,
9th & Race sts., Cincinnati, O.
Simpson, William,
101 Fayetteville st., Raleigh, N. C.
Simson, Francis C.,
Pentagon Bdg., Halifax, N. S.
Skelly, James J.,
339 E. 14th st., New York, N. Y.
Skinner, William H.,
Pocahontas, Ark.
Slack, Henry R.,
East side Public Square, La Grange, Ga.
Slade, Harry A.,
10 State st., Montpelier, Vt.
Slater, Frank H.,
P. O. Box 10, Matawan, Monmouth Co., N. J.
SLOAN, GEORGE W.,
22 W. Washington st., Indianapolis, Ind.
Smink, Robert W.,
309 W. Spruce st., Shamokin, Pa.
Smith, B. Frank,
Walnut & 3d sts., Harrisburg, Pa.
Smith, Charles B.,
861 Broad st., Newark, N. J.
Smith, Clarence P.,
861 Broad st., Newark, N. J.
Smith, Edward N.,
93 Main st., Thompsonville, Conn.
Smith, Edward S.,
Main st., Port Henry, N. Y.
Smith, Lauriston S.,
King st., St. Augustine, Fla.
Smith, Linville H.,
701 Centre st., Jamaica Plain, Mass.
Smith, Reuben R.,
198 9th ave., New York, N. Y.
Smith, Theodric,
1343 Pennsylvania ave., Baltimore, Md.
Smith, Whitefoord G.,
31 Patton ave., Asheville, N. C.
Smith, Willard A.,
Main st., Richfield Springs, N. Y.
Smithson, David E.,
Emmett, Canyon Co., Idaho.
Sniteman, Charles C.,
Neillsville, Clark Co., Wis.
Snook, William H.,
1017 W. Main st., Richmond, Va.

Snow, Charles W.,
214 Warren st., Syracuse, N. Y.
Snyder, Ambrose C.,
13½ St. Felix st., Brooklyn, N. Y.
Snyder, Robert J.,
2d & Market sts., Louisville, Ky.
Sohrbeck, G. Henry,
3d ave. & 16th st., Moline, Ill.
Sohrbeck, George W.,
1601 3d ave., Moline, Ill.
Solomons, Isaiah A.,
163 Congress st., Savannah, Ga.
Sombart, John E.,
Care of Geo. H. Sombart, Wilmore, Kan.
Sords, Thomas V.,
315 Pearl st., Cleveland, O.
Spalding, Warren A.,
89 Church st., New Haven, Conn.
Sparks, James M.,
718 Garrison ave., Fort Smith, Ark.
Sperry, Herman J.,
633 Chapel st., New Haven, Conn.
Sprague, Wesson G.,
Main st., Flushing, Mich.
Sprowl, George M.,
Union City, Ind.
Squibb, Edward H.,
36 Doughty st., Brooklyn, N. Y.
St. Jacques, Gaston,
St. Hyacinthe, Que., Can.
St. John, Sydney S.,
Lakota, N. Dak.
STACEY, BENJAMIN F.,
Thompson Square, Charlestown, Mass.
Staebler, Richard,
848 Broad st., Newark, N. J.
Stachle, Louis L.,
169 S. Orange ave., Newark, N. J.
Stahlhuth, Ernst H. W.,
5th & Washington sts., Columbus, Ind.
Stamford, William H.,
256 Mulberry st., Newark, N. J.
Stamm, Dante M.,
Geneseo, Ill.
Stange, Carl F.,
3214 25th st., San Francisco, Cal.
Staudt, Louis C.,
15 S. Broadway, Aurora, Ill.
Stearns, Frederick,
371 Lafayette ave., Detroit, Mich.
Stedem, Frederick W. E.,
Broad st. & Fairmount ave., Philadelphia, Pa.
Stedem, Laurence S. A.,
11th & Master sts., Philadelphia, Pa.
Steele, George R.,
Main & Prospect sts., Thompsonville, Conn.
STEELE, JAMES G.,
1006 Pine st., San Francisco, Cal.
Steiner, Samuel G.,
The Duncan, Nashville, Tenn.
Steinhauer, Frederick,
1553 Larimer st., Denver, Colo.
Stevens, Alviso B.,
915 Oakland ave., Ann Arbor, Mich.
Stewart, Francis E.,
13 University Place, New York, N. Y.
Stoddard, Thomas,
84 Seneca st., Buffalo, N. Y.
Stoehr, Julius J.,
King st., Garrett, Ind.
Stott, Samuel T.,
505 Penna ave. N. W., Washington, D. C.
Stoughton, Dwight G.,
204 State st., Hartford, Conn.
Stowell, Daniel,
1045 Washington st., Boston, Mass.
Streett, Edmund O.,
1401 N. Charles st., Baltimore, Md.
Stroup, Freeman P.,
303 N. 12th st., Philadelphia, Pa.
Stuart, Wm. A.,
800 W. Baltimore st., Baltimore, Md.
Stuver, Emanuel,
Rawlins, Wyo.
Sweeney, Robert O.,
Duluth, St. Louis Co., Minn.
Sweet, Caldwell,
22 W. Market Square, Bangor, Me.
Symonds, Arthur H.,
Conneaut, Ashtabula Co., O.
Takamine, Jokichi,
475 Central Park, W., New York, N. Y.
Taylor, Augustus C.,
201 Maryland ave. N. E., Washington, D.C.
Taylor, George E.,
615 Harrison ave., Leadville, Colo.
Taylor, Mallory H.,
2d & Cherry sts., Macon, Ga.
Taylor, Walter T.,
Charity Hospital, New Orleans, La.
Terrill, Willis E.,
9 State st., Montpelier, Vt.
Thames, Joseph J.,
E. Main st., Taylor, Williamson Co., Tex.

Thieman, John H., Jr.,
1600 W. Broadway, Louisville, Ky.
Thomas, Daniel J.,
345 Wyoming ave., Scranton, Pa.
Thomas, John B.,
Baltimore & Light sts., Baltimore, Md.
Thomas, Oscar E.,
164 Main st., Columbia, S. C.
Thomas, Robert, Jr.,
126 Broadway, Thomasville, Ga.
Thomasson, Anders,
277 Central st., Lowell, Mass.
Thompson, Albert D.,
101 S. Washington ave., Minneapolis, Minn.
Thompson, Albert E.,
Baltimore & Light sts., Baltimore, Md.
Thompson, William B.,
4804 Trinity Place, W. Philadelphia, Pa.
Thompson, William S.,
703 15th st., Washington, D. C.
Thorn, Henry P.,
Main st., Medford, N. J.
Thurston, Azor,
Grand Rapids, Wood Co., O.
Thweatt, Archibald,
Main st., Humboldt, Tenn.
Tigner, James O.,
Greenville, Meriwether Co., Ga.
Tilden, Amos K.,
31 School st., Boston, Mass.
Tobin, John M.,
Narragansett Pier, R. I.
Todd, Albert M.,
204 N. Rose st., Kalamazoo, Mich.
Topley, James,
166 Georgia st., Vallejo, Solano Co., Cal.
Topping, Chas. O.,
19 Vine st., Brooklyn, N. Y.
Torbert, Willard H.,
736 Main st., Dubuque, Ia.
Tracy, David W.,
139 Main st., Hartford, Conn.
Treat, Joseph A.,
Stuart, Guthrie Co., Ia.
Trefethen, Frederick J.,
Naval Dispensary, Kittery, Me.
Treherne, John C.,
189 Hernando st., Memphis, Tenn.
Troxler Constantine, Jr.,
228 W. Breckenridge st., Louisville, Ky.
Truax, Charles,
42 Wabash ave., Chicago, Ill.
Tsheppe, Adolph,
64th st. & Park ave., New York, N. Y.
Tucker, Greenleaf R.,
City Hospital, Boston, Mass.
Turner, George H.,
296 S. Pearl st., Albany, N. Y.
Turrell, Judson W.,
Longmont, Colo.
Tuthill, Frederic P.,
520 Putnam ave., Brooklyn, N. Y.
Uhlich, Ferdinand G.,
2001 Salisbury st., St. Louis, Mo.
Urban, Jacob P.,
60 Ontario st., Cleveland, O.
Van Winkle, Abraham W.,
35 Clinton ave., Newark, N. J.
Vargas-Heredia, Jorge,
71 Falmouth st., Boston, Mass.
Varney, Edward F.,
39 Tremont st., Boston, Mass.
Vaughan, Parry W.,
Main st., Durham, Orange Co., N. C.
Vellines, Davies,
700 N. Fulton ave., Baltimore, Md.
Verner, James,
33 Woodward ave., Detroit, Mich.
Viallon, Paul L.,
Park & Front sts., Bayou Goula, La.
Vitt, Rudolph S.,
3860 S. Broadway, St. Louis, Mo.
Vockroth, Emil,
79 Newark ave., Jersey City, N. J.
Voigt, Joseph F.,
840 Market st., Chattanooga, Tenn.
Vonachen, Frank H.,
622 North Adams st., Peoria, Ill.
Vordick, August H.,
Jefferson ave. & Benton st., St. Louis, Mo.
Voss, Geo. W.,
680 Woodland ave., Cleveland, O.
Votteler, William,
Shelby & Oak sts., Louisville, Ky.
Waddell, Minor T.,
1207 Ash st., Indianapolis, Ind.
Waggener, Richard,
Warrington, Fla.
Wagner, Henry,
9th & Linn sts., Cincinnati, O.
Walbrach, Arthur,
1200 15th st., Denver, Colo.
Waldner, Paul J.,
U.S.S. Kearsarge, Navy Dep., Wash'ton, D.C.

Walerius, Mathias,
U. S. M. Hospital, St. Louis, Mo.
Walker, David,
601 S. W. Boulevard, Kansas City, Mo.
Walker, E. Edward,
Forksville, Mecklenburg Co., Va.
Walker, John P.,
Main st., Freehold, N. J.
Walker, Thomas A.,
206 F. Oak st., Charlotte, N. C.
Walker, William J.,
74 State st., Albany, N. J.
Wall, Otto A.,
4532 Virginia ave., St. Louis, Mo.
Walter, Charles A.,
129 W. Georgia st., Indianapolis, Ind.
Walts, Charles C.,
Antietam & Potomac sts., Hagerstown, Md.
Walts, David Y.,
Naval Hospital, Portsmouth, N. H.
Wangler, Conrad D.,
227 E. 4th st., Waterloo, Ia.
Wanous, Josie,
521 Nicollet ave., Minneapolis, Minn.
Ward, A. Jae,
107 E. Pike's Peak ave., Colorado Spr'gs, Colo.
Ward, Charles A.,
P. O. Box 460, Stoneham, Mass.
Wardell, Robert C.,
Residence Unknown.
Ware, Charles H.,
1930 Madison ave., Baltimore, Md.
Wain, William E.,
1st st., Keyport, N. J.
Warner, William R.,
1228 Market st., Philadelphia, Pa
Warren, William M.,
154 Lafayette ave., Detroit, Mich.
Watson, Herbert K.,
803 Market st., Wilmington, Del.
Watson, Sidney P.,
137 Richardson st., Atlanta, Ga.
Watt, George H.,
Pullman, Wash.
Watters, Henry,
Sparks & Bank sts., Ottawa, Can.
WAUGH, GEORGE J.,
Ontario st., Stratford, Ont., Can.
Wearn, William H.,
Trade & Tryon sts., Charlotte, N. C.
Weaver, Francis M.,
111 Main st., Oklahoma City, Okla. Ter.
Webb, William H.,
556 N. 16th st., Philadelphia, Pa.
Webber, J. Le Roy,
277 Greene ave., Brooklyn, N. Y.
Webster, H. Gordon,
15 Washington ave. W., Minneapolis, Minn.
Weida, Charles A.,
224 N. 5th st., Reading, Pa.
Weilemann, Charles A.,
2148 Green st., Philadelphia, Pa.
Weihe, Otto A.,
640 Post st., San Francisco, Cal.
Weiss, Conrad H.,
25 Monroe st., Anacostia, D. C.
WELLCOME, HENRY S.,
8 Snow Hill, London, Eng.
Weller, Frank P.,
755 8th st. S. E., Washington, D. C.
Wells, Edwin H.,
43 Hanover st., Boston, Mass.
Wendell, Henry E.,
3d & George sts., Philadelphia, Pa.
Wenzell, William T.,
436 Oak st., San Francisco, Cal.
Werner, Rudolf C.,
2592 Atlantic ave., Brooklyn, N. Y.
Wescott, William C.,
Pacific & Delaware aves., Atlantic City, N. J.
West, Charles A.,
8 Fulton st., Boston, Mass.
Westcott, James W.,
423 N. Charles st., Baltimore, Md.
Westmann, Frank H.,
2744 Cass ave., St. Louis, Mo.
Wetterstroem, Albert,
2867 Coleram ave., Cincinnati, O.
Wetterstroem, Theodore D.,
3929 Spring Grove ave., Cincinnati, O.
Wheeler, William D.,
21 Massachusetts ave., Boston, Mass.
Whelpley, Henry M.,
2342 Albion Place, St. Louis, Mo.
Whitcomb, Frederick E.,
Washington & Garrison aves., St. Louis, Mo.
White, George H.,
Newark & Jersey aves., Jersey City, N. J.
White, Herbert E.,
Jamestown, N. Dak.
White, Richard F.,
499 Gough st., San Francisco, Cal.
Whitehead, Eugene T.,
Main st., Scotland Neck, N. C.

WHITFIELD, THOMAS,
240 Wabash ave., Chicago, Ill.
Whitney, Edgar F.,
Warren, Minn.
WHITNEY, HENRY M.,
North Andover Depot, Mass.
Wichelns, Frederick,
192 Greenwich st., New York, N. Y.
Wickham, William H.,
91 Fulton st., New York, N. Y.
Wiegand, Thomas S.,
145 N. 10th st., Philadelphia, Pa.
Wiesel, John M.,
1101 Madison ave., Baltimore, Md.
Wikle, Jesse L.,
1010 Noble st., Anniston, Ala.
Wilbur, Lot,
Ave. C & 1st st., Snohomish, Wash.
Wilhite, Frank T.,
39 Public Square, Anderson, S. C.
Williams, George G.,
P. O. Box 3551, Boston, Mass.
Williams, John K.,
391 Main st., Hartford, Conn.
Williams, Richard W.,
Notre Dame st., Three Rivers, Que., Can.
Williams, Seward W.,
8 Brighton ave., East Orange, N. J.
Williams, William H.,
659 Main st., Wheeling, W. Va.
Williamson, Lee,
330 W. Balto. st., Baltimore, Md.
Willis, Henry,
4 St. John st., Quebec, Can.
WILSON, BENJAMIN O.,
14 Milk st., Boston, Mass.
Wilson, Charles F.,
2003 Park ave., St. Louis, Mo.
Wilson, Frank M.,
133 Main st., Willimantic, Conn.
Wilson, John M.,
Groveton, N. H.
Wilson, William,
86 Broadway, New York, N. Y.
Winkelmann, Harry C.,
31 Hopkins Place, Baltimore, Md.
WINKELMANN, JOHN H.,
31 Hopkins Place, Baltimore, Md.
WINTER, JONAS,
202 Prospect st., Hagerstown, Md.
Wittich, Matthew H.,
2451 Bloomington ave., Minneapolis, Minn.
Wittmer, Joseph W., Jr.,
527 Clay st., Dubuque, Ia.
WOLTERSDORF, LOUIS,
171 Blue Island ave., Chicago, Ill.
Wood, Alonzo F., Jr.,
2 Church st., New Haven, Conn.
Wood, Edward S.,
688 Boylston st., Boston, Mass.
Wood, James P.,
2 Church st., New Haven, Conn.
Wood, John W.,
Naval Hospital, Newport, R. I.
Wood, Mason B.,
P. O. Box 357, East Providence, R. I.
Woodman, Walter I.,
St. Augustine, Fla.
Woodruff, Roderick S.,
92 Prospect st., Waterbury, Conn.
Woods, Charles H. A.,
Cairo, Ill.
Woodworth, Charles B.,
254 W. Wayne st., Fort Wayne, Ind.
Wooten, Thomas V.,
943 W. Madison st., Chicago, Ill.
Wright, Frank C.,
Cave Springs, Ga.
Wuensch, Charles,
494 Springfield ave., Newark, N. J.
Wulling, Frederick J.,
Minn. University, Minneapolis, Minn.
Wunderlich, Edward,
1415 Dryades st., New Orleans, La.
Wurmb, Theodore H.,
1923 E. Grand ave., St. Louis, Mo.
Yarnold, Edwin,
1222 C st. S. W., Washington, D. C.
Yearby, William M.,
123 E. Main st., Durham, N. C.
YORSTON, MATTHEW M.,
1063 Central ave., Cincinnati, O.
Youngs, William,
Room 6, Thornton Bl'd, Rich Hill, Mo.
Zellhoefer, George,
1044 Broadway, Brooklyn, N. Y.
Zemp, William R.,
P. O. Box 258, Camden, S. C.
Ziegler, Philip M.,
526 Penn st., Reading, Pa
Zimmermann, Albert,
2113 S. Adams st., Peoria, Ill.
Zimmermann, Bernard,
45 E. 4th st., St. Paul, Minn.

Zoeller, Edward V.,
Main st., Tarboro, N. C.
Zuenkeler, J. Ferd.,
1902 Vine st., Cincinnati, O.
Zwick, Karl G.,
1102 Madison ave., Covington, Ky.

LIST OF MEMBERS WHO HAVE RESIGNED SINCE PUBLICATION OF LAST REPORT.

	Elected.		Elected
Bley, Alphonso A. W.	1889	Maine, August	1892
Cambier, Jacob	1895	Morley, Wm	1876
Chapin, Wm. A.	1886	Shimer, Miles H	1897
Cook, Gilbert S.	1886	Stecher, Henry W.	1895
Dreiss, James E.	1898	Van Antwerp, Andrew	1890
Druehl, Frank A.	1889	Van Antwerp, Garet	1880
Estes, Joseph J.	1870	Washburn, Harry M.	1890
Goold, Joseph E.	1896	Whitman, Nelson S.	1875
Hoyt, Geo. M.	1875	Williams, Chas. F.	1888
Kelly, Geo. A.	1882	Wooldridge, Daniel F.	1890
Kirchhofer, Paul	1881	Zimmermann, Chas.	1881
Lane, Edward B.	1893		

LIST OF MEMBERS WHO HAVE DIED SINCE PUBLICATION OF LAST REPORT.

Blatchford, Eben,	Rockport, Mass.,	Elected 1857
Buck, John,	Chelsea, Mass.,	" 1855
Bullock, Charles,	Philadelphia, Pa.,	" 1857
Cameron, Donald L.,	Rutherford, N. J.,	" 1897
Chapin, Fred. H.,	Hartford, Conn.,	" 1880
Cotton, Wm. H.,	Newport, R. I.,	" 1885
Eger, George,	Cincinnati, O.,	" 1864
Eggers, Frederick H.,	Allegheny, Pa.,	" 1872
Girling, Robert N.,	Detroit, Mich.,	" 1876
Hancock, J. Henry,	Baltimore, Md.,	" 1870
Hudnut, Alexander,	New York, N. Y.,	" 1857
Pennington, T. H. S.,	Saratoga, N. Y.,	" 1877
Reed, Thomas D.,	Montreal, Can.,	" 1896
Reynolds, Richard (Honorary),	Leeds, England,	" 1882
Robertson, Peter,	Newberry, S. C.,	" 1896
Squibb, Edward R.,	Brooklyn, N. Y.,	" 1858
Woodward, Brinton W.,	Lawrence, Kan.,	" 1895

LIST OF MEMBERS DROPPED FROM THE ROLL FOR NON-PAYMENT OF DUES, ACCORDING TO ARTICLE III., CHAPTER VII., OF THE BY-LAWS.

(PUBLISHED IN ACCORDANCE WITH A GENERAL RULE, ADOPTED AT MONTREAL, CANADA, AUGUST, 1896. SEE PAGE 17, VOLUME 44, PROCEEDINGS).

Andrew, Edgar C.,	Montgomery, Ala.,	Elected 1895
Asplin, John H.,	Cleveland, Ohio,	" 1882
Avary, Moody B.,	Atlanta, Ga.,	" 1892
Beasley, William A.,	Fairmount, Ind.,	" 1894
Beckmann, Oscar A.,	Louisville, Ky.,	" 1879.
Belt, Z. James,	Wilmington, Del.,	" 1876
Bent, Edward C.,	Bell Rapids, S. D.,	" 1897
Bowron, Walter H.,	Caldwell, Ohio,	" 1890
Burdick, Frederick R.,	Syracuse, N. Y.,	" 1897
Burton, William A.,	Athol, Mass.,	" 1896
Cabell, Henry O.,	Fort Ethan Allen, Vt.,	" 1897
Campbell, Marion J.,	Residence unknown,	" 1897
Chapman, William H.,	Montreal, Canada,	" 1895
Clinton, Frederick S.,	Red Fork, I. T.,	" 1897
Clowes, William L.,	Manzanola, Colo.,	" 1895
Collins, Carrie S.,	Garner, Iowa,	" 1895
Collins, Edward S.,	Wilmington, Del.,	" 1897
Curry, Alfred M.,	West Plains, Mo.,	" 1897
Danner, William E.,	Philadelphia, Pa.,	" 1896
Davis, Edward B.,	Nashville, Tenn.,	" 1896
Davison, James,	Denver, Colo.,	" 1895
Davoll, David L., Jr.,	Chicago, Ill.,	" 1897
Derning, Michael,	Fort Niobrara, Neb.,	" 1897
Dubé, J. Edmond,	Quebec, Canada,	" 1897
Dunning, Lyman T.,	Sioux Falls, S. D.,	" 1897
Earl, Noble C.,	Portland, Me.,	" 1894
Ekman, N. Adolf,	Oroville, Cal.,	" 1889
Elfstrum, Axel F.,	Willmar, Minn.,	" 1897
Eschman, Clemens L.,	Phœnix, Arizona,	" 1889
Foster, J. Webb,	Baltimore, Md.,	" 1894
Freericks, Frank H.,	Cincinnati, Ohio,	" 1897
Furl, Irwin W.,	Phœnix, Arizona,	" 1894
Galt, Edward P.,	Selma, Ala.,	" 1883
Gilbert, Chas. A.,	Providence, R. I.,	" 1891
Graham, Joseph H.,	Chelsea, Mass.,	" 1897
Griffith, Thomas,	Columbus Barracks, O.,	" 1897
Hardigg, Wm. L.,	Uniontown, Ky.,	" 1881
Hawley, William B.,	Faribault, Minn.,	" 1895
Heddens, Claus H.,	Wellsburg, Iowa,	" 1893
Henry, Hubert,	Brooklyn, N. Y.,	" 1897
Hermann, J. George,	Cumberland, Md.,	" 1878
Heseltine, David W.,	Portland, Me.,	" 1896
Hillebert, George A.,	Wynnewood, I. T.,	" 1894
Holgate, Francis H.,	Toronto, Can.,	" 1895
Hudson, T. F.,	Phœnix, Arizona,	" 1894

Irvin, Wm. A.,	El Paso, Texas,	Elected 1879
Johnson, Knute A.,	Granite Falls, Minn.,	" 1897
Joyce, Robert,	Residence unknown,	" 1895
Jungkind, John A.,	Little Rock, Ark.,	" 1887
Kaczoroski, Adolph O.,	New Orleans, La.,	" 1895
Kellam, Chas. R J.,	Heron Lake, Minn.,	" 1895
Kelley, Chas. M.,	Washington, D. C.,	" 1897
Klayer, Louis,	Cincinnati, Ohio,	" 1884
Klock, George H.,	Brooklyn, N. Y.,	" 1897
Kneuper, George,	New York, N. Y.,	" 1897
Kneuper, George M.,	New York, N. Y.,	" 1897
Koehnken, Herman H.,	Cincinnati, Ohio,	" 1875
Lee, Charles J.,	Valley City, N. D.,	" 1896
Lisle, Justin D.,	Springfield, Ohio,	" 1894
Mann, Albert,	Ann Arbor, Mich.,	" 1889
McFarland, Robert M.,	Henderson, Ky.,	" 1893
Moore, Charles G.,	Eufaula, I. T.,	" 1892
Morse, Edwin T.,	Boston, Mass.,	" 1897
Morton, John W.,	Fort Smith, Ark.,	" 1894
Muir, Ebenezer,	Montreal, Canada,	" 1895
Myers, Wm. H.,	New York, N. Y.,	" 1897
Neathery, James M.,	Van Alstyne, Tex.,	" 1892
Nowers, Lawrence E.,	Hillsborough, N. M.,	" 1892
Overstreet, William P.,	Louisville, Ky.,	" 1893
Peck, Frank H.,	Memphis, Tenn.,	" 1897
Peyton, Robert D.,	Louisville, Ky.,	" 1887
Pfiffner, Fritz J. R.,	Delaware, Ohio,	" 1894
Power, John J.,	Quebec, Canada,	" 1897
Prescott, Horace A.,	Dorchester, Mass.,	" 1875
Ranson, Edward A.,	Lachine, Canada,	" 1897
Rich, Willis S.,	Willard, N. Y.,	" 1882
Roberts, Thomas,	Churdan, Ia.,	" 1897
Rogers, Edward,	Evansville, Ind.,	" 1897
Scholtz, Edmund L.,	Denver, Colo.,	" 1881
Schroeder, John H.,	Cincinnati, Ohio,	" 1896
Sharp, Harry,	Atlanta, Ga.,	" 1890
Simpson, William C.,	Vienna, Ill.,	" 1895
Slaughter, Philip M.,	Richmond, Va.,	" 1897
Smink, Wm. H. R.,	Shamokin, Pa.,	" 1885
St. Cyr, Nelvil,	Hayti, W. I.,	" 1897
Starz, Emil A.,	Helena, Mont.,	" 1895
Stearns, Henry A.,	Detroit, Mich.,	" 1888
Sullivan, John W.,	Valley City, N. D.,	" 1897
Temple, Oscar F.,	Fort Riley, Kas.,	" 1897
Thomason, Richard J.,	New Rochelle, N. Y.,	" 1897
Thompson, John,	Residence unknown,	" 1897
Tremble, John E.,	Montreal, Canada,	" 1896
Trevitt, Cleophas A.,	Rome, Ga.,	" 1896
Ulm, Albert G.,	Cavalier, N. D.,	" 1897
Warren, Edwin A.,	St. Paul, Minn.,	" 1887
Weeks, B. Frank,	Cincinnati, Ohio,	" 1891
Wells, Charles H.,	Pueblo, Colo.,	" 1893
Winnberg, John M.,	Jamestown, N. Y.,	" 1892

INDEX.

A.

Abietene, 739
Acacia, detection of dextrin, 643
mucilage, preservation, 493
syrup of, 521
Acanthaceæ, 593
Acetanilid, history and preparation, 831
Acetates, commercial, estimation of acids in, 796
chromic, isomeric, 797
Acetochloro-galactose, 833
Acetone, dicarbonic acid, 763
occurrence in plants, 797
oil, removal from alcohol, 763
Acetum convallariæ, 426
Acetylene, action on copper, 730
generation on a small scale, 729
purification, 729
tetra-bromide, as separating fluid, 730
Acid, acetic, glacial, simple test of strength, 795
acetone dicarbonic, 763
acetyl-salicylic, tests of identity, 802
benzoic, production from coal tar, 798
cacodylic, characters, 773
medicinal use, 774
camphoronic, 748
carbolic, proposed admixture with alcohol, 775
carbonic, comp'ds with water, ether and alcohol, 700
estimation in mixture of gases, 700
limestone, 701
chromodiacetic, 797
digallic, identity with tannin, 804
dihydrobenzoic, 649
embelic, constitution, 803
ferric, 715
hydrocyanic, formation by action of carbonic acid, 702
estimation in presence of ferrocyanide, 703
hyperiodic, atomicity, 690
iodic, atomicity, 689
estimation in crude sodium nitrite, 689
lactic, preparation, 798
malic, in presence of tartaric acid, 802
metavanadic, 554
nitric, determination by cresol, 683
fuming convenient preparation, 684
possible error by diphenylamine reaction, 684
oxynaphthyl-oxytoluylic, 549
phosphoric, determination of lime, 696
phosphorous, influence on reactions, 695
pipitzahoic, as indicator, 802
resinolic, group of resins, 762
salicylic, determination in presence of citric acid, 799
reaction with hydrogen peroxide, 800
use in fruit juices, 800
selenous, sensitive reagent for alkaloids, 809
silico-tungstic, reagent for alkaloids, 807
solanthic, 794
sulphuric, concentration in iron vessels, 691
tartaric, diphenylester, 558
trimethyl tricarballylic, 748
uric, determination, 858
vanadic, 720
Acids, organic, new, 794
Aconite, assay of, 616
Acrolein, preparation, 780
Actinium, 672
Address, chairman's, Jas. M. Good, 84
C. B. Lowe, 277
F. G. Ryan, 118
of welcome, Hon. Richard M. Taylor, 3
Hon. J. Hoge Tyler, 1
Reply to, Wm. C. Alpers, 3
Henry P. Hynson, 4
on behalf of the N. W. D. A., Jno. B. Purcell, 31
President's, A. B. Prescott, 5
Report on, 65
to the Commercial Section, F. E. Holliday, 88
F. G. Ryan, 99
Adeps lanæ, criticism of B. P. tests, 433
Adenandra fragrans, 620
Adlumia cirrhosa, 267
Aethol, 543
Afral, 543
Agents, desiccating, 417
Albumin, egg, crystallization of, 846
of strychnos seeds, 847
Albuminoids, influence on toxicity of alkaloids, 846
molecular value, 846
Alcaramel, 790
Alcohol, as an antidote for carbolic acid poisoning, 261
cetyl, dermatological use, 785
-free grape wines, 629
methyl, in plants, 771
removal of acetone oil, 763
Aldehyde, detection in ether, 763
Alepton, 543
Aletrin, preparation, 504
Algæ, 568
Alizarine, green, new indicator, 844
Alkaloids, acidimetric titration, 807
alkalimetric estimation, 806
constitution, 805
of belladonna, stramonium and hyoscyamus, assay of, 821
bocconia cordata, 128
ceanothus americanus, 138
ipecacuanha, improved process of assay, 821
sambucus canadensis, 190
nux vomica, assay of preparations, 815
salamander, 826
selenous acid, reagent for, 808
silico-tungstic acid, reagent for 807
Almond oil, detection in apricot oil, 780
Aloes, reactions of, 576
Alpers, Wm. C., election as member of the Council, 64
Reply to Address of Welcome, 3
The Alkaloid of Sambucus Canadensis, 190
Alphabetical list of members, 924
names of members from whom money has been received by the treasurer from July 1, 1899, to July 1, 1900, 866
Althæa, syrup of, 521
Aluminum and magnesium, useful alloy, 713
boroformate, solution of, 488
caseinate, preparation, 851
iodide, explosive character, 713
new method of estimation, 713
phosphide, 694
Amanita muscaria, coloring matter, 571

Amber, distinction from copal, 761
method of cementing, 762
Amendments to the By laws, 62
Prosus Bill on Pure Food and Drugs, proposed, 302
action on, 76
Constitution, adoption of, 11, 12
Anidocinnamic acid ether, 544
Amidol, 544
Amines, alkalimetric distinctions, 829
Ammonia, aromatic spirit of, P. P., 513
determination as chloride, 707
liquid, use as solvent, 705
modified Nessler Reagent for, 706
solution, strong, B. P., 480
Ammonium carbonate, variable composition, 707
cyanate, preparation in solid form, 703
hyposulphite, preparation, 691
Amomeaceæ, 580
Analysis of eupatorium perfoliatum, proximate, 216
Anhalonium lewinii, yield and character of alkaloids, 636
Animal chlorophyll, 844
extracts, preparation by cold, 857
ferment, new, 853
ferments oxidizing and reducing kind, 854
presence in kidney of horse, 854
Anisidin citrate, 544
Answers to queries issued by the Scientific Section of the A. Ph. A., 109
Antiæthylin, 544
Antiherpin, 544
Antimellin, 544, 638
Antimony, double fluorides of, 724
preparations, B. P. process of assay, 723
sulphide, reduction by hydrogen, 724
Antincon, 544
Antiphlogistin, 544
Antipyrine, action of iodine, 830
Antiseptic bandages, pharmacopœial recognition of, 431
gauzes, formulas, 432
Antitoxin diphtheria, pharmacopœial recognition of, 271
Antitussin, 544
Apparatus, ball-pulverizing, 394
extraction, simple, 396
filtering, 399
for distillation with steam, 411
Apocynaceæ, 594
Application of the modified alkalimetric method to the assay of drugs and galenicals, 122
Applicants for membership, reading of names of, 32, 61
Aqua carminativa, 428
regia, 428
cosmetica, Kummerfeld, 428
matico, 428
ophthalmica, Conrad, 428
Aqualit, 545
Arabic, gum, detection of gelatin, 643
Araliaceæ, 613
Aralia nudicaulis, histology of root, 613
proximate examination, 614
Aralicne, 615
Araroba, commercial quality, 650
Argentum colloidale, 727
Arginine, 831
Arnica root, sophistication, 600
Arrow poisons, 663
Arsencasceinates, 543
Arsenic, estimation of small quantities, 720
liability to be overlooked in testing, 721
Arsenides, new, 721
Arsycodile, 545
Artificial ice, composition, 678
Asafetida, constituents and ash, 610
Aspirator, new, 402
Aspirin, 802, 545
Assay, alkaloidal, of fluid extracts, 806
of drugs by the use of living plants, 171
pharmacologic, 165
Asterol, 545
Asthma drops, 528
powders, 545
Astra, 545
Atrabilin, 545
Atropa belladonna or scopola carniolica, 211
Atropine, characters, 819
Atroscine, characters, 820
Aurantiaceæ, 629
Ayapana, 546

B.

Bacillariæ, 568
Bacillus, tubercle, composition, 568
Bacteria, effects of extreme cold, 569
Bacteriology, pharmaceutical, 186
Bacterium, on sugar cane, 569
Balance, chemical, convenient, 387
prescription, 388
Ball-pulverizing apparatus, 394
Balsam, blackberry, standard, 449
cod liver oil, 454
Peru, constituents, 649
commercial specimens, 649
Tolu, natural and exhausted, 649
Bamboo, manna-like exudation, 575
Bandages, antiseptic, 431
and gauzes, sterilizer for, 432
Barium arsenide, 721
peroxides, 674
phosphide, 695
tin oxalate, 799
Bark, durali, alkaloids in, 596
loeri, proximate constituents, 651
pomegranate, new alkaloid in, 639
wild cherry, deterioration by age, 640
and its preparations, 207
Barks, coto, new varieties, 609
Barksdale, Geo. E. The Cerate of the Extract of Cantharides, 263
Barosma Ecklonlana, 620
venusta, 621
Bases, solanaceous, characters, 818
Basicine, 812
Basicin, 546
oil, 546
Basil oils, 757
Bath, steam, economical construction, 408
Beal, Jas. H. A General Form of Pharmacy Law Suitable for Enactment by the Several States of the U. S., 309
Beans, tonka, cultivation in Venezuela, 650
Bees wax, Italian imitation, 669
with rosin-like taste, 669
Belladonna alkaloids, assay of, 821
fluid extract, use of acetic acid, 465
leaves, improved assay, 588
percentage of alkaloid, 590
plaster, B. P., assay, 450
plasters, variation in strength, 451
root, assay, 588
Bengal lights, 539
Benzoic acid, production from coal tar, 798
Berberideæ, 617
Betulin, 845
Betuol, 546
Bishop's essence, 528
Bismuth, determination in organic salts, 724
et ammonii citratis, liquor B. P., 483
liquor B. P., 485
oxysalts, in crystalline form, 725
salicylate, composition and properties, 801
precautions in dispensing, 801
subcarbonate, nitric acid in, 725
subgallate, properties, 804
Bitters, English, 449
stomach, 449
Blepharis capensis, 593
Blinding tree, 661
Blister, mild liquid, 539
red, 539
sprain, 539
sure, 539
Blood, guaiac reaction for, 847
preparations, modern, 848
Bocconia cordata, the alkaloids of, 128
Borates, improved flame method of detection, 698
metallic, preparation, 699
volumetric determination, 698

Bottle, non-refillable, 420
sponge, holder for, 422
stopper and extractor, 421
Boxes, dusting, new, 504
Boyd, Geo. W. Some of the Reasons why Comp'd Spirit of Ether and Ethereal Oil do not merit space in the U. S. Pharm., 254
Brachycladus Stuckerti, 602
Brit. Pharm. Society's materia medica museum, 559
Bromipin, 546
Bromoform, estimation in toxicology, 768
mixtures, danger of separation, 493
syrup of, formula, 525
Bromphthalimid, 546
Buchu leaves, substitutes, 620
Bulnesia sarmienti, 621
Bunsen burner, improved, 407
Burette rack, convenient, 389
weighable, 391
Burner, Bunsen, improved, 407
Butter, cacao, constants, 781
rancidity of, 783
variation in composition, 785
By-Laws, amendments to, 62
of the Association, 885
Council, 894

C.

Cabinet, filtering and percolating, 403
Cacao butter, constants, 781
rancidity, 783
Para and Amazonas, 627
Cacodylic acid, characters, 773
medicinal use, 774
Cade, oil of, examination, 747
Cæsium, specific gravity of, 708
Caffeine, danger in medicinal use, 826
potassium ferrocyanide reagent for, 826
Calcium carbide, acetylene yield, 699
color due to iron, 699
carbonate, precipitated, advantages of, 710
presence of formic acid, 710
chloride, purification, 708
crystallized, 708
eosotate, 549
glycerophosphate, solution of, 488
syrup of, 488
wine of, 488
hydride, preparation, 709
lactophosphate, commercial, 798
nitride, 709
peroxide, 674
Calamine, spurious, 717
Caluna vulgaris, quercetin in, 600
Calomel, conversion into corrosive sublimate, 725
Camphor, artificial production, 583
dentrifice, 503
lotion, 491
Camphorated tooth powder, 503
Cannabis Indica, potency of, 665
Cantani's serum, 490
Cantharides, cerate of extract of, 263
Caoutchouc and gutta percha, 661
improved method of preparation, 662
Landolphia, 659
Capia gangona, 659
Caprifoliaceæ, 609
Capsaicin, characters, 839
Caramel, commercial, 790
Caraway oil, by-products of distillation, 752
Carboformal-bricks, 546
Carbolic acid, admixture with alcohol, 775
Carbon disulphide, preservation, 700
Carbonic acid, compounds with alcohol, ether and water, 700
estimation in mixture of gases, 700
limestone, 701
Capsules, Cognet's, 546
elastic, preservation, 431
Cardamom, volatile oil of, 580
oil, identity of Malabar and Mysore, 752
Carvacol-glucoside, 833
Cascara, aromatic fluid extract of, 473
Cascara, glucosides of, 837
liquide, Alexandre, 547
Cascarilla oil, components, 758
Caseinum vegetabile, 546
Castor oil, production in India, 663
Catha edulis, constituents, 609
Cathartic drugs, chemistry of, 836
Catheter lubricants, 541
Caryophyllene and cadinene, nitrosoderivatives, 747
Caydeau-so, 758
Cayenne pepper, analysis of, 591
Ceanothus americanus, alkaloids of, 138, 658
Cedar, therapeutic value, 667
oil, Atlas, 667
Celastrinaceæ, 658
Cellulite, 787
Celluloid, 788
varnish, 542
Cellulose, chemically modified, 786
in ossa sepiæ, 785
new industrial products, 786
tetracetate, 786
tetrabutyrate, 786
Cement for alcohol bottles, 542
universal, 542
Cephalin, 547
Certificate of incorporation of the Amer. Pharm. Assoc., 882
Cetyl alcohol, dermatological use, 785
Chamomile drops, English, 528
Chaplan, 629
Chaulmoogra seeds, botanical source, 633
tone, 633
Cheiranthus alkaloids, characters, 828
cheira, constituents of seeds, 632
Cheirinine, 632, 828
Chemical drugs, estimation of purity, 671
Chemicals and solutions, pharmaceutical, 426
Cheron's serum, 490
Chielin, 547
Chinosol, 547
Chirol, 547
Chloretone, 547
Chlorinated lime, explosion in close vessels, 684
Chlorobromophenes, 776
Chloroform, electrolytic preparation, 767
rectification and preservation 767
test bottle, 767
Chloroglobin, 847
Chlorophyll, animal, 844
Chlorosenin, 548
Chloroxydiphenylquinoxaline, 831
Choline, physiological action, 828
Chondrus, source and collection, 568
Chrysolein, 548
Cimicifugin, preparation, 505
Cinchona alkaloids, perbromides of, 811
acetic fluid extract, 469
assay by aid of acetic acid, 603
bark, assay of, 469
cultivation in Java, 602
defects of official process of assay, 605
fluid extract, Ph. Helv., 468
assay, 468
liquid extract, standardization, 467
wines, approved formulas, 536
Cinnamein, 649
Cinnamon chips, ash content, 594
Citral, determination, 741
Citronella oil, constituents, 748
Java, superiority, 749
lana batu, 748, 749
maha pangiri, 748
Cloves, histology of, 637
Cobalt, nitrate, antidote for prussic acid, 716
Coca leaves, description, 630
adulteration, 630
Cocaine hydrochloride, chromic acid test for, 814
Maclagan's test for, 813
Cochineal, ash determination, 668
Codeine, strong basicity, 820
Cod-liver oil balsam, 454
emulsion, 453
casein, 454
egg, 453
glycerin, 453

Cod-liver emulsion, Irish moss, 453
malt, 453
preparation in Norway, 670
Coffee, analysis of various sorts, 607
Cognac, egg, 450
Cognet's dragees de protoxalate de fer, 498
Cola acuminata, 625
vera, 626
Colchicine, extraction and estimation, 140
Colchisal, 548
Cold cream cooling salve, 440
Collodion, inefficiency as a test for carbolic acid, 445
oxide of zinc, 446
paraform, 446
styptic, 445
Collodium acetonatum, 446
corrosivum, 446
flexile, improved, 445
iodoformin atum, 446
salicylatum, 446
viatorium viride, 446
Colloidal metals, insolubility, 672
Colocynth, cultivation in Cyprus, 636
Color standards of the vegetable drugs of the U. S. Ph., 146
Colquiyuyu, 659
Commercial course in a college of pharmacy, 99
value of pharmaceutical education, 96
Committee, auditing, 59, iv
report of, 17
nominating, 19
report of, 20
of arrangements for the meeting of 1901, ix
research, election of, 275
report of, 148
on arrangements for exhibition at next meeting, 67
centennial fund, 59, iv
Chairman Lowe's address, 291
report of, 319
Ryan's address, 122
report of, 260
commercial interests, v
credentials, appointment, 16
report of, 11
Ebert Prize, v
report of, 121
European tour, report of, 46
finance, 59, iv
report of,
future welfare of the Association, 66
report of, 65
general prizes, v
report of, 64
membership, 59, iv
report of, 36
auxiliary, vi
report of, 35
national formulary, vi
report of, 33
auxiliary, for revision, vi
legislation, vi
report of, 292
pharmaceutical education and legislation, v
practical pharmacy and dispensing, v
report of, 103
preliminary education of students of pharmacy, report of, 323
president's address, 20
report of, 65
publication, 59, iv
report of, 16
revision of the U. S. Pharm., v
report of, 261
scientific papers, v
simultaneous meeting of the A. Ph. A. and N. A. R. D., 60, vi
status of pharmacists in the army, navy and marine hospital service of U. S., viii
report of, 70
time and place of next meeting, 20
report of, 55
transportation, 59, v
Committee, on transportation, report of, 68
weights and measures, vii
weights and measures, report of, 34
to incorporate in model pharmacy law all amendments adopted, 290
report of, 305
place the model pharmacy law before the state associations and state boards of pharmacy, 318
Committees of the Council, 59, iv
Association, v–x
Communication from S. L. Rumsey, 77
Compositæ, 600
Condenser, made from glass percolator, 415
new, 414
reflux, for beakers, 416
Coniferæ, 666
Congo red, cause of color change by acids, 832
Containers, colored glass, 420
Constitution, amendments to, adoption of, 11, 12
and By-Laws, 884
Convallaria majalis, strength of root and leaves, 577
Convallariæ, acetum, 426
Conveniences, prescription, 417
Convolvulaceæ, 594
Convolvulus althæoides, resin content, 594
Cooling salves, 440
Copaiba, B. P. tests for, 648
Surinam, characters, 648
Copper, determination in preserves, 718
gilding and silvering, 543
hypophosphite, preparation, 719
solubility in gelatin solutions, 718
Cordage fibre, new source, 577
Corks, saturation with caoutchouc, 421
Corn Killer, formula, 446
Cotarnine hydrochloride, properties, 810
Coto barks, new varieties, 609
Cotoin, compound with formaldehyde, 839
Cotton, hydromise, 552
Cotton-seed, industrial products, 623
oil, crude, crystalline body in, 623
Cough syrup, standard formula, 525
Council, committees of, 59, iv
officers of, 58, iv
members of, iv
minutes of, 13, 32, 58, 60, 61
new, organization of, 58
election of officers and committees, 50
Cream, carbonate of zinc, 438
Creolin, commercial, 777
Creosin, 548
Creosote, wood tar, composition, 774
Cresegol, 776
Cresol emulsion, 506
Crocy s serum, 490
Crocus, examination, 578
Croton oil, distinctive characters, 664
Cruciferæ, 632
Crurin, 548
Cryptocarpa pretiosa, 609
Cubebs, microscopical features, 656
Cucurbitaceæ, 636
Cumarin, synthetic, distinction, 841
Cuprene, 730
Cupriaseptol, 548
Cupric and cuprous phosphides, 718
Cuprol, 555
Curangaegenin, 839
Curangin, 838
Cure, mange, efficient, 539
Cutter, soap, convenient, 422
Cyanoform, 769
Cynarase, 852

D.

Datura alba, percentage of alkaloids, 591
Delegates to the American Medical Association, viii
Nat. Assoc. Retail Druggists, ix
Report of, 54
Wholesale Druggists, ix
Pharmacopœial Convention, Report of, 69
Pure Food and Drug Congress, ix
Report of, 295
Delphinium staphisagria, 617
pictum, 617

Dentifrice, camphor, 503
Depilatorium siccum, 539
Desiccating agents, 417
Detannated wine, B. P. C., 535
Dialyzed iron, improved method of preparation, 485
Diastasic ferment in yolk of egg, 856
Didymium salicylate, 800
Diehl, C. Lewis, Report on the Progress of Pharmacy, 345
Digitalis, assay of, 587
comparison of commercial varieties, 586
lutea, new yellow coloring matter, 588
percentage of digitoxin, 587
Digitoxin, therapeutic value of, 833
Diosma ericoides, 620
Diphtheria antitoxin, pharmacopœial recognition of,
Diplotaxis tenuifolia, poisonous alkaloid in, 632
Dishes, evaporating, porcelain, 409
Distillation, device for cutting off the flow of gas, 413
fractional, 412
Dithan, 548
Djoeatin, 638
Djoeat, 548
Dohme, A. R. L. and *H. Engelhardt*, Atropa Belladonna or Scopola Carniolica, 211
Dolomol, 548
Dormiol, 549
Dragees de protoxalate de fer, Cognet, 498
Dropper, medicine, official, 393
Drops, asthma, 528
chamomile, English, 528
proposed pharmacopœial definition of, 393
Droseraceæ, 635
Drug adulterations, change in methods, 567
Drugs, assay of by the use of living plants, 171
cathartic, chemistry of, 836
causes of commercial scarcity, 562
chemical estimation of purity, 671
pharmacologic assay of, 165
powdered, ash in, 566
commercial quality, 566
vegetable of the U. S. Ph., definition of measurements, 664
standardization, 565
West African, 561
Dujardin-Beaumetz's solution, 490
Durali bark, alkaloids in, 596
Durinum, 549
Dusting boxes, new, 504
powder, boric acid-carbolic, 503
salicylated talc, 503

E

Earth, fuller's, quality for dusting powder, 714
Eberle, E. G., Fluid Extract Labels, 333
Ecthol, 549
Egg cognac, 450
Egols, 549
new antiseptics, 776
Elacagneae, 582
Elastic capsules, preservation, 431
Election of officers of the Association for the ensuing year, 20
Council, 59
Section on Com'l Int., 114
Educat. & Legis., 291
Prac. Phar. & Disp., 64
Scientific Papers, 183
W. C. Alpers to fill a vacancy in the Council, 64
James M. Good to fill a vacancy in the Council, 61
A. B. Prescott to fill a vacancy in the Council, 61
Elemi, genuine and allied sorts, 654
Elixir acetanilidi, 447
absinthii compositum, 448
ferri, quininæ et strychininæ, 448
glonoini, 448
of terpin hydrate, 448
and codeine, 448
potassii arsenitis, 448
Elixir simple, 447
strychninæ arsenatis, 448
Elixirs, defects in N. F. formulas, 447
formulas of the Philadelphia Hospital, 447
Emanuel, Louis, A Scheme to Popularize the U. S. Pharm. as the only Means to Combat Quackery in Medicine, 94
Embelic acid, constitution, 803
Emetine, melon, 636
Emplastrum hydrargyri compositum, 451
lithargyri cum resina pini, 451
saponatum salicylatum, 452
stomachale, 452
Empleurum serrulatum, 621
Emulsifier, simple, 452
Emulsio amygdalarum, 455
dulcificata, 455
Landerer, 455
Emulsion, cresol, 506
Emulsions, cod-liver oil, 453
caseine, 454
egg, 453
glycerin, 453
Irish moss, 453
malt, 453
determination of percentage of oil, 452
egg, 454
formulas of the Philadelphia Hospital, 455
Emulsum olei gaultheriæ, 455
morrhuæ, 455
cum hypophos., 455
lactophos., 455
terebeni, 455
terebinthinæ, 455
Endomentol, 549
England, Joseph W. On the Pharmacopœial Recognition of Diphtheria Antitoxin, 271
Entertainments at the forty-eighth annual meeting, 343
Eosolates, silver and quinine, 549
Epicarin, 549
Epileptic mixture, Phil. Hosp., 492
Ergot, active constituents, 572
of wild rice, 573
preservation by formaldehyde, 573
standardization, 573
Ergotin, Bonjean, 459
depurat., 459
siccum, 459
Yvon, 460
Ergotinum, Bombelon fluidum, 459
spissum, 459
Denzel fluidum, 459
Kohlmann fluidum, 459
pur. dialysat. Wernish, 459, 460
siccum Wiggers, 460
Ericineæ, 600
Erroneous prescriptions, 340
Erythroxylaceæ, 630
Erythrosine, as alkali indicator, 676, 677
Esbach's reagent, 479
Eserine, preservation of solution, 818
salts, prevention of color, 818
Essence, Pishop's, 528
of rennet, formula, 489
Ether, compound spirit of, 254
Ethyl nitrite preparations B. P., loss of strength, 764
assay by Eykman process, 764
colorimetric method, 765
Eucalypti stringy bark, 638
Eucalyptus capitellata, 639
eugenioides, volatile oil in, 639
macrorhyncha, 639
piperita, 639
punctata, 639
Eudesmol, 748
Eugenoform, 550
Eugot, 550
Euonymus atropurpureus, constituents of bark, 658
Eupatorium perfoliatum, proximate analysis of, 216
Euphorbiaceæ, 659
Euphorbia latyris, 659
helioscopia, 659
Euphorbon, 763
Evaporating dishes, porcelain, 409

Examination of urine, blood, sputa and like substances by the practical pharmacist, 191
Excacaria agallocha, 661
Excipients, pill, various, 496
Extraction apparatus, simple, 396
flask, 397
of drugs, selection of menstrua, 455
Extract, belladonna, fluid, use of acetic acid, 465
cascara, aromatic, fluid, 473
cinchona, liquid, B. P. standardization, 467
fluid. Ph. Helv., 408
assay, 468
acetic, 469
gentian, B. P., 464
ipecacuanha liquid, B. P., 470
licorice, composition, 461
examination, 462
meat, composition, 460
mimra-puama, fluid, 473
taraxacum U. S. P., 464
witchhazel, distilled, 474
Extracts, animal, preparation by cold, 857
dry, addition of gum arabic, 458
fluid, acetic, 470
profitable preparation, 465
lemon, commercial, 514
powdered, preparation, 458
solid, value of ethyl and methyl alcohols as menstrua, 456
Extractum belladonnæ viride, B. P., 460
caryophyllorum aquos. spiss., 465
quebracho fluid, 473
valerianæ fluid, 473.
Eye waters, objections to use of salicylic acid, 446

F.

Fantumia elastica, 597
africana, 598
Fennel, adulteration, 609
Ferment, diastasic, in yolk of egg, 856
animal, new, 853
of locust beans, 852
Ferments, animal, oxidizing and reducing kinds, 854
presence in kidney of horse, 854
Fern, male, influence of soil, 575
Ferratogen, 550
Ferratose, 550
Ferri albuminati, liquor, Drees, 486
determination of iron content, 487
preparation, 486
perchloridi, liquor, fortis, B. P., 585
Ferric acid, 715
chloride, solution of, 485
lanolin, 550
pyrophosphate, soluble, inefficiency of the U. S. P. test for presence of orthophosphate, 697
salicylate, 801
solutions, preparations with H_2O_2, 485
Ferrinol, 555
Ferrum arsenico-citricum ammoniatum, 802
oxydatum lacto-saccharatum, 501
redactum, B. P., comparison of assay methods, 715
Fersan, 550
Fibre, cordage, new source of, 577
vulcanized, 787
Ficus bengalensis, 660
File, prescription, home-made, 418
Filices, 575
Filing prescription, convenient plan, 418
Filtering and percolating cabinet, 403
apparatus, 399
Filter-paper, toughened, 406
-press, 403
vacuum, simple, 401
water, handy, 403
Filtration and washing, continuous, 403
water-pump, 402
Finance, general rules of, 899
Finger marks, latent, 422
Fixed oils, effervescent, 494
Flacourtianeæ, 633
Flask extraction, 397
Flax seed, new sophistication, 623
percentage of oil, 622
Flora Filippinensis, 560
Floor waxes, formulas, 542
Flower pigments, development, 841
Flowers, insect, cultivation in Algeria, 601
Fluid extract labels, 331
extracts, acetic, 470
profitable preparation, 465
Fluorine in mineral waters, 690
Fluoroform, pure preparation, 769
Foods, artificial, 425
Foot powder, 503
Formaldehyde, comparison of tests, 772
bisulphite, 550
detection, 772
fatal case of poisoning, 773
preservative of medicinal preparations, 772
effect, 773
Form of application for membership, 901
completing membership, 901
Formulary of non-official preparations, 423
Fortoin, 550
Fractional distillation, 412
Frangula, glucosides of, 837
Fruit juices, filtration of, 515
syrups, examination, 525
Fuller's earth, quality for dusting powders, 714
Fungi, resistance to acids, 570
Funnel, safety, novel, 405
support, convenient, 404
wire, 406
with strainer, 405

G

Galenicals and chemicals, examination, 424
Ganjah, 665
Gas generator, simple construction, 701
Gasterin, 551, 856
Gaultherase, 640
Gaultherin, 640
Gaultheroline, 551
Gauze, carbolic acid, 433
iodoform, 433
Gauzes, antiseptic, formulas, 432
Gelatin, detection in gum arabic, 643
serum, 491
Gelsemium sempervirens, structure of phloem, 596
General rules of finance, 899
Genista tinctoria, coloring matters, 651
Genistein, 652
Gentian, extract B. P., 464
Ginseng, cultivation in America, 615
Glacier salve, 551
Glass containers, colored, 420
rods, precautions against breakage, 411
vessels, loss in weight during evaporation, 410
Gletscher salve, 551
Glucose, diabetic, determination, 792
gravimetric estimation, 792
impurities, 793
Glucoside, cresol, 832
naphthol, 832
Glucosides, synthetic, 832
Glutektones, 551
Glycerin, commercial, satisfactory, 777
examination, 777
properties, 778
soaps, 509
Glycerinum iodatum, 474
Glycerite of codeine, 475
licorice, 474
Glycerole of ipecacuanha, 470
Glycerophosphates, commercial quality, 779
solubility in water, 778
Glycyrrhizin, determination of, 834
Gold, determination with hydrogen peroxide, 728
Gonococcus, new stains, 569
Good, Jas. M., Chairman's address, 84
election as member of the Council, 61
Gordin, H. M. and *A. B. Prescott*, Short Directions for the Assay of Opium, 126
Extraction and Estimation of Colchicine, 133

Gordin, H. M., Application of the Modified Alkalimetric Method to the Assay of Drugs and Galenicals, 122
On the Alkaloids of Ceanothus Americanus, 138
Gossypetin, 623
Gossypium herbaceum, coloring-matter of flowers, 623
Gossypol, 624
Graminaceæ, 575
Granular effervescent magnesium citrate, 501
Gravimetroscope, 387
Gravity, specific, determination at official temperature, 389
Greeting from Germany, Fred'k Hoffmann, 5
Guaiac, constituents, 621
Guaiacolcacodylate, 551
Guaiacol determinations, 775
Guaiamar, 551
Guajakinol, 551
Guaza, 665
Gujasanyl, 551
Gum arabic, detection of gelatin, 643
Gum resins, analysis of different kinds, 612
percentage of nitrogen, 611
structural characters, 611
Gut, silk-worm, 667
Gutta percha, sources, 662
Gynocardia soap, 510, 552
Gypsum, theory of hardening, 711

H

Hancoria specisa, 598
Hayem's serum, 490
Headache preparations, examination, 538
Hederin, 609
toxicity of, 839
Hedonal, 552
Hemp, Indian, physiological effects, 665
Henbane leaves, result of assay, 588
Herard's solution, 490
Heroin, poisoning by, 810
Hoffmann, Fred'k, A Plea for a National Library and Museum of the History of Chemistry and Cognate Arts and Sciences, 320
Greeting from Germany, 5
Holder for bottle sponge, 422
Holliday, F. E., Address to the Commercial Section, 88
Homonataloin, 836
Honey, influence of artificial feeding, 668
Hops, chemical examination, 665
Houghton, E. M., The Pharmacologic Assay of Drugs, 165
Houthin, 552
Howell, E. V., Alcohol as an Antidote for Carbolic Acid Poisoning, 261
Huchard's solution, 491
Hydnocarpus anthelmintica, 634
Wightiana, 635
Hydrastis impurities, 616
Hydrocinnamoin, production, 799
Hydrogen dioxide, preparation, 680
inefficiency of preservation, 680
liquid, effect on seed germination, 676
peroxide, rate of decomposition, 680
safe method of igniting, 676
solidification, 675
method of, 675
tetroxide, supposed formation, 681
Hydromise cotton, 552
Hynson, Henry P., Reply to Address of Welcome, 4
Hyperiodic acid, atomicity, 690
Hyppophæ rhaminoides, 581
Hyoscyamine, characters, 819
Hyoscyamus alkaloids, assay of, 821
Hyoscine, characters, 819

I.

Ibit, 553
Ice, artificial, composition, 678
Ichthyol suppositories, 517
Idonaftan, 553
Igazol, 553
Incorporation, certificate of, 882
Law for the District of Columbia, general, 881
Indian hemp, physiological effects, 665
Indican, occurrence in plants, 842
Indicators, volumetric, 672
Indigo blue and red, estimation, 843
formation in plants, 842
natural and artificial, 843
preparation in China, 842
tests for, in cloth, 843
Infusion of digitalis, hot percolation, 475
Infusions and decoctions by percolation, 475
Ink for glass, 549
pharmacists, good, 549
indelible, red, 549
sympathetic, new, 541
Inorganic chemistry, 671
Insect flowers, cultivation in Algeria, 601
installation of officers of the Association, 78
Iodic acid, atomicity of, 689
estimation in crude sodium nitrate, 689
Iodides, improved B. P. assay, 687
tincture of, 534
Iodine absorption by plants, 686
decolorized tincture, improved, 534
determination in iodides, 687
distribution in sea water, 680
in fresh water algæ, 686
recovery from waste products, 687
tinctures, stricter standardization, 533
Iodized sulphur, 688
Iodoform, detection of small quantities, 768
industrial production, 718
gauze, 453
hint, 433
vinegar as a deodorant, 719
Ionone, attempt at preparation, 756
Ipecac, so-called, 214
Ipecacuanha alkaloids, improved process of assay 821
assay of, 607
false, new, 606
glycerole, 470
Jahore, 606
jonidium, 606
liquid extract, B. P., 470
assay, 472
stability, 472
Irideæ, 578
Iridium, purification of, 728
Iron, arsenate, variable composition, 722
citrochloride, tincture of, 533
dialyzed, improved method of preparation, 485
iodide, syrup of, 513, 520, 523, 524
peptomanganate solution, formulas, 487
pyrophosphate, soluble, 697
Ixodin, 553
Ivy, glucosidal constituent, 609

J.

Jaborandi bases, characteristics, 825
commercial inferiority, 619
leaves, assay, 619
liquid extract, 473
Jacobs, Joseph, The Commercial Value of a Pharmaceutical Education, 96
Jalap roots, notes on, 603
Jambul seeds, effect in diabetes, 648
Japaconine, 817
Japaconitine, derivatives, 817
Japan wax, advantage of, 663
Japbenzaconitine, 817
Jasmin oil, determination of components, 755
new constituents, 755
Jenkins' tooth powder, 551
Jonidium ipecacuanha, 606
Juices, fruit, filtration of, 515
lemon, examination of, 516
Jujubes, composition and preparation, 535

K.

Kangaroo tendons, use in surgery, 671
Kascon, 556
Kava, mode of preparation, 657

Kebler, Lyman F., Notes on Jalap Roots examined during the past six years, 163
Physiological versus Chemical and Microscopical Examination of Drugs, 169
Kefir, water, preparation, 539
Kermes-sirup, 522
Kickxia africana, transfer to new genus, 597
Kino, butea, commercial quality, 646
commercial quality, 645
Malabar, tannin value, 646
Kineurin, 552
Kneipp's remedies, 564
Kola milk, 624
nuts, botanical source, 624
economic uses, 624
Kosam seeds, constituents, 621
Kosamin, 621
Kouso, flores, unsatisfactory quality, 641
Kraemer, Henry, A So-called Ipecac, 214
Assay of Drugs by the Use of Living Plants, 171
and *Herbert J. Watson*, Color Standards of the Vegetable Drugs of the U. S. Pharm, 146
Kronecker and Lichtenstein's serum, 490
Krypton, density of, 673
Kurfürstenwasser, 449

L.

Labels, prescription, novel, 419
shop, paper, 420
Labiatæ, 593
Lactic acid, preparation, 798
Landerer, emulsio, 455
solutio, 455
Lamellæ homatropinæ, B. P., 526
Landolphia caoutchouc, 659
perieri, 659
Lanolin, ferric, 550
Lapodrin, 845
Lard, cause of change, 784
Latta's serum, 490
Lavender oil, variability, 750
Lauracaæ, 583
Lauronol, 553
Lavoderma, 553
Law, general incorporation, for the District of Columbia, 881
model pharmacy, 309
preliminary remarks on and summary by sections, 284
Lead water and laudanum, Phil. Hosp., 491
Leaves, belladonna, assay, 588
percentage of alkaloids, 590
buchu, substitutes, 620
coca, adulteration, 630
description, 630
jaborandi, assay, 619
mulberry, diuretic action of, 666
senna, commercial, 641
Leclerc's serum, 490
Leg lotion, 478
Leguminosæ, 641
Lemon extracts, commercial, 514
juice, examination, 516
oil, adulteration with stearin, 745
citral content, 742, 743
estimation of aldehydes, 744
terpeneless, 743
Lenigallol, 553
Lentils, economic value, 652
Letter from Dr. Fred'k Hoffman, 5
Dr. Edw R. Squibb, 53
Levurine, 553
Licorice, extract, composition, 461
examination, 461
glycerite of, 474
Lights, Bengal, 539
green, 540
Liliaceæ, 576
Lime, chlorinated, explosion in close vessel, 684
glycerophosphate, 778
water, preparation, 481
unsatisfactory condition, 481
Liniment, camphor, valuation, 477
gasolene, 477
rubbing, Sherwood's, 477
soap, formula, 506
Liniments, official, objection to cotton seed oil, 476
Linimentum ammoniæ, B. P., improved, 476
capsici comp., 477
chloroformi comp., Phil. Hosp., 476
gaultheriæ comp., Phil. Hosp., 476
terebinthinæ comp., Phil. Hosp., 476
Linseed meal, percentage of ash and oil, 622
Lint, iodoform, 434
Lipogenin, new ointment base, 443
Lipogenium, 554
Lip salve, improved, 440
Liquid ammonia, use as a solvent, 705
Liquids, immiscible, solubilities in water, 396
Liquor acidi borici, Phil. Hosp., 479
carbolici, Phil. Hosp., 479
ammonii benzoici, 478
antisepticus, Phil. Hosp., 479
alkalinus, Phil. Hosp., 479
bismuthi, B. P., 483
et ammonii citratis, B. P., 483
chlorali bromatus, 478
colchici comp., 478
ferri albuminati, Dress., 485
determination of iron, 487
preparation, 486
perchloridi fortis, B. P., 485
hydrarg. chlor. corros., Phil. Hosp., 479
fortior, Phil. Hosp., 479
lithanthracis acetonatus, 478
compositus, 478
simplex, 479
lithii bromidi, Phil. Hosp., 480
picis cum plumbo, 491
potass. permang., Phil. Hosp., 480
sodii phosphatis, Phil. Hosp., 480
strontii bromidi, Phil. Hosp., 480
List of authorized agents of the A. Ph. A., xvii
colleges and associations having accredited delegates at the forty-eighth annual meeting, 873
committees, special, vi
standing, v
life members, 879
members, alphabetical, 924
from whom money has been received by the Treasurer from July 1, 1899, to July, 1, 1900, 866
dropped for non-payment of dues, 950
honorary, 924
in attendance at the forty-eighth annual meeting, 875
of the Council, iv
residing in foreign countries, 923
who have died since publication of last report, 949
resigned since publication of last report, 949
whose residence is unknown, 923
new, 877
officers of the Association, iii
since its organization. x
Council, iv
since its organization, xv
sections, past and present, xvi
Listulin preparations, 554
Lithium arsenide, 721
distribution in plants, 707
peroxide, 675
preparation by electrolysis, 708
Liimus solution, improved, 489
Local secretary for 1901, election of, 59
Locri bark, proximate constituents, 651
Locust beans, ferment of, 852
Lotio calaminæ, 491
plumbi et opii, Phil. Hosp., 491
Lotion, camphor, 491

Lotion for sweating hands, 492
leg, 478
nail, 478
Lotoflavin, 652
Lotus arabicus, cause of toxicity, 652
Lotusin, 652
Lozenges of the Brit. Pharm. 1898, 534
Lubricants, catheter, 541
Luteol, advantages as indicator, 831
Lutow's serum, 490

M.

Macrotin, preparation, 505
Madar, 661
Magenbitter, 449
Magenlikör, 449
Magnalium, 713
Magnesium, action of water, 711
carbonate, anhydrous, preparation, 712
citrate, granular effervescent, 501
volumetric estimation, 711, 712
Male fern, influence of soil, 575
Malic acid, determination in presence of tartaric acid, 802
Malvaceæ, 623
Manganese fluoride, preparation, 715
oxalate, preparation, 794
selenide, preparation, 714
Mange cure, efficient, 539
Mannogalactone, 793
Mannose, determination, 793
Marble, use as a standardizer, 710
Marks, finger, latent, 422
Mascarenhasia velutina, 598
Massa sebi, 499
Materia medica, 559
museum, the Brit. Pharm. Society's, 559
Matthieu's solution, 490
Maytenus vitis idæi, 659
Meal, flaxseed, new sophistication, 623
linseed, percentage of ash and oil, 622
Meat extract, composition, 460
Medicated soaps, 509, 510
waters, 426, 427, 428
Medicine dropper, official, 393
measure and stopper, automatic, 394
Melon emetine, 636
root, 636
Melting points, determination of, 407
Membership, committee on, iv
report of, 36
auxiliary, vi
report of, 35
Memorial of Wm. Proctor, Jr., 22
Mentha piperita, examination of powder, 593
Mercurial ointment, saponaceous, 557
Mercuric oxycyanide, as disinfectant, 704
Mercuriol, 554
Mercurol, 555
Mercurous iodide, preference of yellow or green, 726
nitrite, reaction with ethyl iodide, 726
Mercury, Australia rich in, 725
chlorosulphide, formation, 726
stearate, 780
Metallic borates, preparation, 699
Metals, colloidal, insolubility, 672
Methenyldi-o-anisidin, 554
Methods of advertising, 91
Methylacetanilidsulphonate of sodium, 554
Methyl alcohol in plants, 771
anthranilate, 745
propylcarbinolurethane, 554
salicylate, as antiseptic dressing, 760
Metric weights and measures, 386, 387
Mexican medicinal plants, 560
Milk, average composition, 849
effect of preservatives, 850
estimation of fat, 850
Kola, 624
sugar, convenient test for, 794
free, preparation, 850
Minutes of Commercial Section, 84
Council, 13, 32, 58, 60, 61
Educational and Legislative Section, 277
Minutes of Scientific Section, 118
Session, First, 1
Second, 20
Third, 58
Fourth, 58
Fifth, 58
Sixth, 58
Seventh, 58
Eighth, 61
Ninth, 61
Tenth, 61
Eleventh, 63
Twelfth, 83
Mistura adstringens, Phil. Hospital, 492
alterans composita, Phil. Hosp., 492
ammonii carb., Phil. Hosp., 492
chloridi et strychnin, Phil. Hosp., 492
argenti comp., Phil. Hosp., 492
bromidia, Phil. Hosp., 492
et arsenici, Phil. Hosp., 492
morphini, Stockes, 493
olei ricini, B. P., 493
Mixture, bromoform, separation in, 493
colic and diarrhœa, standard, 493
epileptic, Phil. Hosp., 492, 493
Model pharmacy law, preliminary remarks on, and summary by sections, 284
Mollplaste, 441
Molybdenum bisulphide, 719
dioxide, 719
silicide, 719
Monoacetyl resorcin, 554
Monoaniscidin citrate, 554
Monophenetidin citrate, 554
Morphine derivatives, 810
forensic determination, 809
Mortarcap, rubber, 395
Motion to add $1,400.00 to list of appropriations for the present fiscal year, 18
another rule to the General Rules of Finance, 18
adopt programme submitted by the General Secretary, the Local Secretary and the Secretary of the Council, 15
allow H. C. Porter to withdraw his resignation, 15
amend Article XI of Chapter VIII of the By-Laws, 62
Chapters VI, VIII and IX of the By-Laws, 62
the General Rules of Finance, 60
appoint a committee of three to confer with a like committee from the N. A. R. D. in regard to simultaneous meeting of the two Associations, 60
appropriate $100.00 for use of the Com. on Membership, 13, 62
$50.00 for use of the Special Committee on the model pharmacy law, 63
arrange for simultaneous meetings of the Section on Com'l Int. and Scient. Papers, 63
authorize C. Lewis Diehl to select an auxiliary committee to assist in revising the National Formulary, 60
the General Secretary to have 40 gold bars made for the Richmond meeting, 15
the loan of $1,000, 14
the payment of the promissory note for $1,000.00, now outstanding against the Association, 18
delay the issue of the Proceedings for 1900 to Nov. 15, 18
devote not less than six hours daily to business during the annual meeting of the Assoc., 62
drop the names of life members from the list when their residence has been unknown for 5 consecutive years, 18
extend thanks to officers and members of boards of pharmacy, 284

Motion to fix May 7 to 12 as the time for holding the 48th annual meeting, 15
have 100 copies of the Report on the Progress of Pharmacy bound in paper, for use of the Committee on Membership, 62
have reprints made of the Memorial of Wm. Procter, Jr., 60
have the Council hold daily meetings at 9:30 A. M., 18
have the Proceedings issued in more durable binding, 13
instruct the Treasurer to sell the bonds belonging to the General Fund, 18
instruct T. A. Miller to have charge of the Social Session to follow at the close of the eleventh session, 78
make the Local Secretary for 1901 chairman of the committee of arrangements for that meeting, 77
pay salaries of officers hereafter in June and December, 18
permit Chas. W. Hancock to withdraw his resignation, 32
print 10,000 copies of the Physician's Epitome of the National Formulary, 14
publish in the Proceedings for 1900 a statement of receipts and expenditures from April 1 to July 1, 1900, 18
recommend the establishment of a new Section, to be known as the Section on Practical Pharmacy and Dispensing, 60
refer all communications received by the Committee on Practical Pharmacy and Dispensing to the Publication Committee, 60
refer all resolutions and motions relative to restriction of time for entertainments to the Committee on Programme, 62
refer report of Committee on National Legislation to the Section on Education and Legislation, 32
refer report of Committee on Revision of the U. S. Pharm. to the Section on Scientific Papers, 32
refer the subject of remuneration for preparing the Epitome of the National Formulary to the Committee on Finance, 18
remit dues of Frank Harrington and to place his name on list of life members, old style, 60
rescind the action of the Scientific Section in regard to paper presented by S. W. Williams, 77
submit in writing all amendments to the draft of a pharmacy law, 284
transfer the accounts of the several funds of the Association from Dover, N. H., to Philadelphia, Pa., 14
Mucilage, acacia, preservation, 493
Muira-puama, fluid extract, 473
Mulberry leaves, diuretic action of, 666
Murcia lemons, 629
Mutton suet, cause of change, 784
Myristicaceæ, 584
Myroxocarpin, 649
Myrrh, distinguishing different sorts, 653
pharmacopœial quality, 653

N.

Nail lotion, 492
Naphtasapol, 554
Naphtasaponata, 554
Naphtha wood, tests of quality, 771
Naphthol-galactoside, 833
Nargol, 555
Nectrianin, 554
Negrolin, 554
Nepodin, 844
Nessler's reagent, improved, 589
Neurine, physiological action, 829
Nickel salts, examination, 716
Nicotine, color reaction of, 827
retention in pipes, 828
Nigrins, 836
Nitric acid, determination by cresol, 683
fuming, convenient preparation, 684
possible error by diphenylamine reaction, 684
Nitrites, alkaline, pure, 682
Nitroform, 769, 770
Nitrogen, atomic weight, 681
chloride, irritant action, 682
compounds with oxygen, 682
estimation, improved, 682
Nitro-propiol tablets, 554
Nomination of A. B. Prescott as member of the Council, 60
Jas. M. Good as member of the Council, 60
Wm. C. Alpers as member of the Council, 64
Notes on jalap roots examined during the past six years, 163
Nucleol, 555
Nural, 555
Nutmegs, fictitious, 584
Nuts, kola, botanical source, 624
economic uses, 624
Nux vomica, alkaloids, assay, 815
presence of copper in seeds, 596
Nylander's reagent, 479

O.

Officers of the Association for 1901, iii
election of, 21
installation of, 78
Council, iv
election of, 59
Section on Commercial Interests, election of, 114
Education and Legislation, election of, 292
Practical Pharmacy and Dispensing, election of, 60
Scientific Papers, election of, 183
Official preparations, examinations, 423
Oil, almond, detection of apricot oil, 780
cascarilla, components, 758
castor, production in India, 663
chevril, composition, 757
cod liver, preparation in Norway, 670
croton, distinctive character, 664
hazel-nut, characters, 783
peanut, advantages of, 784
pine-needle, 739
quince seed, characters, 786
savin, constituents, 739
sulfuro, 558
tung, use as paint, 582
vetiver, by-products of distillation, 758
violet, artificial, 756
wartara, characters, 759
Oil of bergamot, changes, 746
cade, examination, 747
camella drupifera, characters, 758
cardamoms, identity of Malabar and Mysore, 752
caraway, by-products of distillation, 752
chrysanthemum japonicum, properties, 759
citronella, constituents, 748
Java, superiority of, 749
lana batu, 748, 749
maha pangiri, 748
geranium, determination of free acid, 753
jasmin, determination of components, 755
new constituents, 755
lavender, variability, 751
lemon, adulteration with stearin, 745
citral content, 742, 743
estimation of aldehydes, 744
lime flowers, examination, 746
orange, new constituent, 745
orange flowers, yield, 746
peppermint, formation of constituents, 750
substitute from coal tar oil, 751
pinus sabiniana, alleged constituent, 739
poplar bud, humulene, chief constituent, 752
sandalwood, 749

Oil of santal, E. Indian, constituents, 750
saw palmetto, absence in dried fruit, 759
turpentine, commercial quality, 738
wintergreen, advantages of synthetic, 760
Oils, basil, 757
essential, analysis, 732
production in Cyprus, 738
solubility of constituents in sol. sodium salicylate, 737
fixed, effervescent, 494
of lemon, terpeneless, 743
orange, terpeneless, 743, 744
volatile, adulterations, 736
estimation in alcoholic solutions, 737
spices, 737
examination, 731
Ointment, gonorrhœa, 440
mercurial, detection of coloring substances, 438
recovery of mercury, 438
saponaceous, 557
of colloidal mercury, 439
mercuric nitrate, made with petrolatum, 439
slab, convenient, 444
tar, made with paraffin, 439
zinc, rapid preparation, 438
Ointments, conditions favoring utility, 435
copper, 439
formulas of Dresden Apoth. Society, 437
identification of chemical reaction, 435
preparation, 435
Oleate, quinine, quick preparation, 495
Oleoresins, analytical values, 760
economical preparation, 495
Oleum æthereum, commercial, 770
jecoris aselli ferro-iodatum, 494
lini sulphuratum, 494
mentholi, 494
theobromæ, adulterants, 781
Onygena equina, 574
Opium, cultivation and collection, 631
modified process of assay, 631
Persian, adulteration, 631
Opoponax, constituents, 612
Orange peel, sweet tincture, 447
syrup of, 518
Orchideæ, 580
Order of business of the Sections, 897
Organic acids, new, 794
Osteogen, 555
Otto of orris, characters, 756
rose, adulterations, 755
chemical and physical constants, 754
Oxidases and peroxidases, action on chlorophyll, 851
in the vine, 851
Oxolin, 542
Oxycratum compositum, 426
simplex, 426
Oxygen, 673
Oxymethylphtalimid, 555
Ozalin water, 555
Ozone, production by means of fluorine, 673

P.

Palo-balsamo-wood, 621
Palto, 659
Papain, action of heat, 853
comparison with pepsin, 853
Papaveraceæ, 631
Paper, filter, toughened, 406
shop labels, 420
Papillin, 555
Paraffinum liquidum, B. P., 731
Parchment paper, 787
Parisen, Geo. W. Urinalysis by the Pharmacist, 197
Parnassia palustris, 635
Partridge, Chas. K. The Status of the Drug Trade in Maine under the Prohibitory Laws of the State, 330
Pasta, zinci, 441
mollis, 441
salicylata, 441
Pasta, zinci, sullurata, 441
saccharata, 441
Paste, sulphur, 441
white, Lassar's, 441
zinc oxide, sulphur and kieselguhr, 440
Pastilli ammon. chlor. c. succ. liquirit, 535
extract opii, Walther, 535
pectorales, Küttner, 535
purgans, 535
Patch, E. L. Answers to Queries Issued by the Scientific Section of the A. Ph. A., 199
Peanut oil, advantages, 784
Pectinase, 789
Pectin, from rose fruits, 789
Pectins, chemistry of, 789
Pegamoid, 788
Pencils, aristol, 515
silver salts, 315
Pentacetyl-glucose, 833
Pentose, tragacanth, 789
Pepper, cayenne, analyses of, 591
Peppermint oil, formation of constituents, 750
substitute from coal tar oil, 751
Pepsin and pancreatin, influence af heat, 855
inadequacy of B. P. test, 855
determination of solvent power, 854
Percentage solutions, B. P., 478
Percolation, expeditious mode of moistening drug, 398
Percolators, sprinkle stopper as outlet, 399
syphon, 399
Perezol, 802
Perl-collodium, 555
Peroxides, characteristic test, 674
Peruanum, 673
Peruvol, 649
Petrolatum, value as ointment base, 444
Petroleum, deodorization, 731
solidified, new ointment base, 444
Petrosapol, 554
Pharmaceutical bacteriology, 186
Pharmacologic assay of drugs, 165
Pharmacy law, model, 309
preliminary remarks on and summary by sections, 284
Phenezol, 556, 776
p-Phenetidin citrate, 556
Phenoleum, 556
Phenyl benzoate, 776
Phenylhydrazine, compound with sodium bisulphite, 830
Phosphorus, convenient form for dispensing, 694
conversion into arsenic, 692
determination in organic compounds, 693
pastes, 693
estimation in oils and fats, 693
trisulphide, production, 695
Physic ball, veterinary, Ticehurst, 499
Physiological *vs.* chemical and microscopical examination of drugs, 169
Physostigmine, preservation of solutions, 818
Pictolin, 556
Pigments, flower, development, 841
Pill excipients, various, 496
Pills, colloidal mercury, 498
Pilocarpine, assay, 824
charcteristics, 825
hydrochloride, characters, 825
nitrate, characters, 825
Pilocarpus racemosus, 618
Pilulæ aloeticæ, 497
argenti colloidalis, 497
asiaticæ, 497
cascaræ sagradæ, 498
digestivæ, Dietrich, 498
ferri carb., Blaudii, 498
ferri jodati, Blanchard, 498
rhei, 498
anglicæ, 498
saponis gynocardiæ, 499
Pine-needle oil, 739
Pinenol, 740
Pinus strobus, characters of oil, 666
Pipette, improved, 391

Plants, Mexican, medicinal, 560
Plasmon, 556
Plaster, belladonna, B. P. assay, 450
Plasters, belladonna, variation in strength, 451
unofficial, 451
what representative pharmacists and physicians say about them, 232
Plea for a national library and museum of the history of chemistry and cognate arts and sciences, 320
Pleurotus olearius, toxity, 574
Plumeride, characters of, 837
Podophyllum, histology of rhizome, 617
Poisons, arrow, 663
Polygonaceæ, 585
Pomade for falling hair, 443
Pomegranate bark, new alkaloid in, 639
Poplar-bud oil oil, humulene chief constituent, 752
Potassium and ruthenium nitrite, 726
arsenate, stability, 722
chlorate, explosive properties, 685
solubility in water, 685
cyanide, com'l quality, 703
ferrate, preparation, 716
iodide, new process of titration, 688
-tin oxalate, 795
volumetric estimation as cobaltinitrite, 704
Poultices, substitute for, 434
wood pulp, 434
Powder, dusting, boric acid-carbolic, 503
salicylated talc, 503
foot, 503
paper opener, 500
papers, convenient case for, 499
tooth, antiseptic, 503
astringent, 503
camphorated, 502
carbolated, 503
Jenkins', 501
menthol, 503
Pussinelli's, 501
rose flavor, 502
saponaceous, 502
Spinner's, 501
violet, 502, 503
Preparations, headache, 538
miscellaneous, 538
non-official, formulary for, 423
official, examinations, 423
Prescription conveniences, 417
file, home-made, 418
filing, convenient plan for, 418
labels, novel, 418
Prescott, A. B., election as member of Council, 61
President's address, 5
and *H. M. Gordin*, Extraction and Estimation of Colchicine, 133
Short Directions for the Assay of Opium, 126
Press, filter, simple, 403
Proceedings of state pharmaceutical associations, 377
Procter, William, Jr., Memorial of, 22
Remarks upon, 29, 30
Propolism, 556
Prosopis strombulifera, use of fruits, 651
Protaceæ, 583
Protargol, solution in water, 536
Ptomaines giving reactions of aconitine, 829
Purcell, John B., address, 31
Pulvis calcariæ comp., 500
chinini tannici comp., 501
dentifricius, Jenkins', 501
Pussinelli, 501
Spinner, 501
galactopœus, 501
inspersorius cum bismutho subgallico, 501
tanoformo, 501
zinco oxydato, 501
zinco-salicylatus, 501
Pussinelli's tooth powder, 501
Pyrantin, soluble, 557
Pyrobetulin, 845
Pyrojapaconine, 817
Pyroxylin, soluble, to secure, 788

Q.

Quince seed oil, characters, 784
Quinine acetate, solubilities, 812
chloride-sulphate, 557
eosolate, 549
hydrochloride and caffeine, soluble compound, 812
oleate, quick preparation, 495
manufacture in Java, 812
tannate, tasteless, new proccess for, 813

R.

Rack, burette, convenient, 389
Radio-active material, new, 672
Ranunculaceæ, 616
Reagent, Esbach's, 479
Nessler's, improved, 489
Nylander's, 479
Red fire, 540
indellible ink, 540
Reflux condenser, for beakers, 416
Remarks on Wm. Procter, Jr., 29, 30
Remedies, Kneipp's, 564
Remington, Joseph P., Memorial of Wm. Procter, Jr., 22
Rennet, essence, formula, 489
Renzi's solution, 491
Report of Auditing Committee, 17
Chairman of Council on the Invested Funds of the Association, 74
Committee on Credentials, 11
Chairman Lowe's Address, 319
Ryan's Address, 260
Ebert Prize, 121
European Tour, 46
Future Welfare of the Association, 65
General Prizes, 64
Membership, 36
auxiliary, 35
National Formulary, 33
Practical Pharmacy and Dispensing, 103
President's Address, 65
Publication, 16
Status of Pharmacists in the Army, Navy and Marine Hospital service of the United States, 70
Time and Place of Next Meeting, 55
Transportation, 68
Weights and Measures, 34
Delegates to the N. A. R. D., 54
Pharmacopœial Convention, 69
Pure Food and Drug Congress, 295
Financial accounts in care of the General Secretary, 52
supplementary, 864
Nominating Committee, 20
Secretary of Section on Education and Legislation, 280
Treasurer, 47
supplementary, 862
on correspondence with manufacturing chemists with reference to the Use of the Metric System, 76
preliminary education for students of pharmacy, 323
the progress of pharmacy, 345
Resaldol, 557
Resignation of H. M. Whelpley as member of the Council, 59
Resin, scammony, ether test for, 504
Resins, gum, percentage of nitrogen, 611
analysis of different kinds, 612
structural characters, 611

Resin, gum, resinolic acid group of, 762
Resolution endorsing the work of the N. A. R. D., 75
to petition Congress to repeal Schedule B of the Revenue Bill, 75, 98
prevent the interjection of entertainments throughout the sessions of the Sections, 62
Resolutions in regard to establishment of a national standardization bureau, 323
of thanks to the citizens of Richmond, the local Secretary, the Committee of Arrangements, 80
Resorbin mercury, 557
Revolving sieve, practical, 395
Rheum Franzenbachii, 585
Rhamnaceæ, 658
Rhamninose, solubility, 793
Rhubarb, constituents of different sorts, 585
glucosides of, 837
Ricinine dibromide, 827
preparation and characters, 827
Rods, glass, precautions against breakage, 411
Roll of members, 902
Root, licorice, histology of, 644
volatile oil in, 645
melon, 636
Rose, otto of, adulterations, 754
chemical and physical constants, 754
Rubber, natural substitutes, 660
mortar cap, 395
Piralahy or Valaelahy, 659
Rubiaceæ, 602
Rules of finance, general, 899
Rumex, acetosa, poisoning by leaves, 586
special yellow coloring matter, 586
Russian weights and measures, 387
Ruthenium and potassium nitrite, 726
Ryan, F. G. Address on a Commercial Course in a College of Pharmacy, 99
Chairman's Address, 118

S.

Safety funnel, novel, 405
Saffron, culture in India, 578
relation of oil to coloring matter, 579
tinctorial power, 579
Salamander alkaloids, 826
Salicylates of the rare earths, 800
Salicylic acid, in presence of citric acid, determination, 799
reaction with hydrogen peroxide, 800
use in fruit juices, 800
Saligenin, compound with tannin, 835
Salve, cooling, cold cream, 440
plaster, 441
Salves, cooling, 450
Samandaridine, 827
Samandarin sulphate, 826
Sambucus canadensis, alkaloid of, 190
Sandalwood oil, 749
Sandalwood, plantations in India, 582
Sanguinarine nitrate, commercial, nature of, 256
Santalaceæ, 582
Santal oils, E. Indian, constituents, 750
Santalol, not a homogeneous body, 749
Sanservia Ehrenbergii, source of cordage fibre, 577
Sapeler's solution, 490
Sapodermin, 511, 557
Sapo calomelanos mollis, 510
glycerini liquidus, 510
hydrargyri mollis, 510
kalinus albus, 510
mollis, 505, 506
Sapotan, 554
Savin oil, constituents, 739
Saw palmetto oil, absence in dried fruit, 759
Scammony resin, ether test for, 504
Scheme to popularize the U. S. Pharm. as the only means to combat quackery in medicine, 94
Schlotterbeck, J. O., Adlumia Cirrhosa, 267
The Nature of Commercial Sanguinarine Nitrate, 256
and *Paul Murrill*, The Alkaloids of Bocconia Cordata, 128
Schneider, Albert, Pharmaceutical Bacteriology, 186
Schneider, Albert, Suggestions on the Introduction of Powdered Vegetable Drugs in the U. S. Pharm., 141
Schulze, Louis, Erroneous Prescriptions, 340
Schwartz's solution, 490
Scopola, official recognition of, 590
Scopolamine, characters, 820
Scrophulariaceæ, 586
Sealing wax, insoluble in alcohol, 541
Secretary, Local, for 1901, Election of, 59
Seed, cotton, industrial products, 623
oil, crude, crystalline body in, 623
flax, percentage of oil, 622
germination, 567
Seeds, chaulmoogra, botanical source, 633
true, 633
effect of heat on germination, 567
jambul, effect in diabetes, 638
Kosam, constituents, 621
Seminose, 852
Senna leaves, Alexandria, spurious, recent, 642
commercial condition, 641
Septicidin, 557
Serum, Cantani's, 490
Ceron's, 490
Crocq's, 490
Gelatin, 491
Hayem's, 490
Kronecker & Lichtenstein's, 490
Latta's, 490
Leclerc's strong, 490
Luton's, 490
Surgical, 490
Short directions for the assay of opium, 126
Sicco, 557
Sidnal, 558
Sieve, revolving, practical, 395
Sieves, convenient and cheap, 396
Silk-worm gut, manufacture of, 667
Silver, action of hydrogen sulphide, 727
chloride, reduction by hydrogen, 727
double salts with copper, 728
eosolate, 549
sulphide, action of hydrogen, 727
Simms, G. G. C., Under What Restrictions should Pharmacists be Permitted to Sell Liquors, 341
Soap cutter, convenient, 422
ether, formula, 507
glycerin, liquid, 510
green, improved preparation, 507
gynocardia, 510, 552
liniment, 506
liquid antiseptic, 506
soda, 506
mercurial, soft, 510
potash, white, 510
sodium superoxide, 558
solution, ethereal, 508
spirit of, 507
Hebra's, 507
tobacco, 510
Soaps, cod liver oil, superfatted, 510
glycerin, 509
medicated, 509, 510
Soda, laundry, composition, 705
Sodium acetanilid sulphonate, 543
arsenate solution, incompatibility with strychnine, 482
stability, 721
bicarbonate, temperature of liberation of CO_2, 704
borate, a general poison antidote, 698
cacodylate, hypodermic injections, 774
mixture, 774
pharmaceutical uses, 774
pills, 774
rectal injections, 774
metavanadate, 730
methyl acetanilid sulphonate, 554
nitrite, manufacture of, 683
phenacetin sulphonate, 556
phosphate, presence of arsenic, 606
dried, preparation, 696
saccharate, 791
superoxide soap, 558

Sodium vanadate, 720
Solanaceæ, 588
Solanaceous bases, characters, 818
Solanthic acid, 794
Solubilities of immiscible liquids in water, 396
Solutio acidi picronitrici, Esbach, 479
argenti colloidalis albuminata, 727
bismuthi alkalina, 479
boro-salicylatus, 479
Landerer, 455
sodii chloridi physiologica, 479
Solution aluminum boroformate, 488
ammonia, strong, B. P., 480
calcium glycerophosphate, 488
Dujardin-Beaumetz's, 490
ferric chloride, preparation, 485
Herard's, 490
Huchard's, 491
litmus, improved, 489
Matthieu's, 490
peptomanganate of iron, formula, 487
Renz's, 491
Sapelier's, 490
Schwartz's, 490
soap, ethereal, 508
sodium arsenate, B. P., incompatibility with strychnine, 482
Sydmann's, 490
zinc chloride from oxide, 488
Solutions, ferric, preparation with H_2O_2, 485
Some of the reasons why comp'd spirit of ether and ethereal oil do not merit space in the U. S. Pharm., 254
Species laxantes, Schrammii, 511
lini, 511
Moldau, 511
pectorales cum fructibus, 511
laxantes, 511
resolventes, 511
Specific gravity, determination at official temperature, 389
Spinner's tooth powder, 501
Spiræas, glucosides in, 640
Spirit, Ammonia, aromatic, B. P., 513
nitrous ether, preservation, 512
Spiritus aetheris nitrosi, deterioration in shop, 511
formicarum, changes on keeping, 513
saponatus, improved formula, 508
Spleniferrin, 558
Squibb, Dr. Edward R., letter from, 53
Stannic oxalates, preparation, 795
Staphylase, 558
Starch, gioss, preparation, 789
Status of the drug trade in Maine under the prohibitory laws of the State, 330
Steam-bath, economical construction, 408
Stedem, F. W. E., Methods of Advertising, 91
The Examination of Urine, Sputa and Like Substances by the Practical Pharmacist, 191
Sterculia, 626
Sterculiaceæ, 624
Stevens, A. B., Wild Cherry Bark and its Preparations, 207
Stomach, bitters, 449
liqueur, 449
Stopper and extractor, bottle, 421
Storax, characterization, 599
source of, 599
Stramonium alkaloids, assay of, 821
seeds, loss of atropine during growth, 591
Stringy bark, brown, 639
eucalypti, 638
red, 639
white, 639
Strontium arsenide, 721
phosphide, 695
Strophanthus Kombe, importance of obtaining seed in pods, 597
Strychnine salts, soluble double salts with sodium salicylate, 816
solubility in chloroform, 815
Strychnos guyanensis, 596
poisonous and innocuous species, 594
Stypticine, 811
Styraceæ, 599
Succus herbarum, D. A. S., 517
Sudol, 558
Sudoral, 558
Suet, benzoinated, 510
Sugar blueing, change in method, 790
improved method of titration, 791
milk, convenient test for, 794
pure, supply of, 790
reducing, gravimetric estimation, 791
Suggestions on the introduction of powdered vegetable drugs in the U. S. Pharm., 141
Sulfosot, 558
Sulfuro oil, 558
Sulphates, detection in presence of thiosulphates, 692
Sulphuric acid, concentration in iron vessels, 691
Sulphur, iodides of, 689
iodized, preparation, 688
perfluoride, 690
Support, funnel, convenient, 404
Suppositoria glycerini, D. A. S., 517
Suppositories, cold process and moulding, 517
Surgical serum, 490
Sydmann's solution, 490
Syrup, acacia, 521
althæa, 521
bromoform, 525
calcium glycerophosphate, 488
cough, standard, 525
ferrous arsenate, 524
hydriodic acid, 520
hypophosphites, 521
iodide of iron, 520
orange, 518
rose, 519
tolu, 523
B. P., 523
wild cherry, 518
acetous, 518
Syrups, fruit, 525
medicinal, official, improved formulas, 518
official, influence of density, 520
rapidity of inversion of cane sugar, 521
Syrupus althææ c. vin stibiat., 522
amygdalæ, 520
castaneæ vescæ, 522
coccionellæ, 522
codeini, 522
creosoti, 522
ferri albuminati, 522
iodidi, 519
B. P. assay of, 523
Ph. Germ., 524
quininæ et strychninæ phosph., 519
hypophosphitum, 519
plantaginis, 522
scillæ compos, 523
valerianæ, 523
zingiberis, 523

T.

Tablets, nitro-propiol, 554
Tablet triturates, keeping qualities, 526
popularity of, 525
Tallow, cause of change, 784
Tannin, chloral preparation, 804
determination, 803
Taps, water, splash prevented, 417
Taraxacum, extract, U. S. P., 464
root, method of assay, 600
Tartar emetic, possible adulterants of, 724
Tartaric acid, diphenylester, 558
Tea, Abyssinian, 627
Arabian, 627
Batoum, 627
Bourbon, 627
Brazilian, 627
Bush, 627
Caper, 628
Cope, 627
Fahrm, 627
Labrador, 628
leaves, varieties and substitutes, 627
mountain, 628

Tea, New Jersey, 628
Oswego, 628
Paraguay, 628
substitutes, 628
Russian, 628
West Indian, 628
Tenalgin, 559
Tendons, kangaroo in surgery, 761
Terebene, commercial, examination of, 740
Terebinthaceæ, 653
Ternstromiaceæ, 627
Terpenes of lemon oil as an adulterant, 741
Terpine hydrate preparation with H_2O_2, 741
Thee Bömischer, 628
Theobroma kalagua, 627
Thermometer, high temperature, 406
scale, new, 406
Thymegol, 776
Thymol carbonate, 559, 777
Thyroid, arsenic in, 856
bromine in, 857
Ticehurst's veterinary physic ball. 496
Tin, electrolytic determination in preserves, 718
Tinctura antasthmatica, 528
aurantii comp., 528
cascaræ sagradæ, 528
chamomillæ anglica, 528
chloroformi et morphinæ, B. P., 533
cocæ, 528
coffeini composita, 528
condurango, 528
frangulæ, 528
guaranæ, 528
composit., 528
kolæ, 528
ratanhiæ borata, 528
salicylata, 529
rhei comp., B. P., improved, 533
rusci composita, 529
sacchari tosbi, 529
Tincture, bitter orange peel, B. P., 528
cinchona, definite strength, 529
digitalis, fat-free, 530
iodides, 534
iodine, decolorized, improved, 534
stricter standardization, 533
iron citrochloride, extemporaneous, 533
kino, cause of gelatinization, 532
myrrh, B. P., 531
nux vomica, from the drug direct, 530
presence of copper, 531
opium, analysis, 532
strophanthus, removal of fat, 531
sweet orange peel, 447
Tinctures by maceration, B. P., 527
Tobacco, estimation of nicotine, 592
smoke, poisonous constituent, 592
soap, 510
Toilet waters, 514
Tolu syrup, 523
Tooth powder, antiseptic, 503
astringent, 503
camphorated, 502
carbolated, 503
Jenkins', 501
menthol, 503
Pussinelli's, 501
rose-flavor, 502
saponaceous, 502
Spinner's, 501
violet, 502, 503
Tortoine, 559
Tragacanth pentose, 789
Syrian, 644
Treasurer, supplementary report of, 862
Tree, blinding, 661
Triangles, improved, 410
Trimethylene, similarity to propylene, 829
Trional mixture, formula, 493
Triturate of active medicaments 527
Trochisci acidi carbolici, B. P., 534
Tropæolum majus, fixed oil of, 622
Tubercle bacillus, composition, 568
Tuberone, 757
Tung oil, use as paint, 583
Tungsten chlorobromides, formation, 719

U.

Under what restrictions should pharmacists be permitted to sell liquor? 341
Unguentum, acidi borici, Credé, 437
anglicum album, 437
argenti colloidalis, Credé, 437
conii, B. P., 444
diachylon cum vaselino, 457
domesticum, 442
hamamelidis, B. P., 440
hamburgense, 437
hydrargyri oxydati pultiformis, 437, 439
iodoformi, 438
leniens, manipulation, 437
picis liquidæ, 438
pomadium aromaticum, 442
Wilsonii, 438
Urea apparatus, simple, 860
from guanidine, 859
Ureometer, new construction, 859
Uric acid determination, 858
Urinalysis by the pharmacist, 197
Urine, blood, and sputa, examination of, 191
Urine, determination of albumen, 858
mercury, 858
Urticaceæ, 664

V.

Vacuum filter simple, 401
Vanadic acid, 720
Vanadium, cosmic distribution, 720
Vanilla, adulteration, 581
cultivation in Mexico, 580
determination of vanillin, 581
preëxistence of vanillin, 581
Vanillin, formation in fruit, 840
from potato peels, 849
sophistication, 850
Varnish, celluloid, 540
Vaselinum camphoratum, 438
carbolisatum, 438
salicylatum, 438
Vegetale, 559
Vermuth, composition, 448
Vessels, glass, loss in weight by evaporation, 410
Vetiver oil, by-products of distillation, 758
Vinegar, estimation, 796
Vinum cascaræ sagradæ, 538
diureticum, 538
muira-puama, 538
Violaceæ, 635
Viola tricolor, methyl salicylate a constituent, 635
Violet oil, artificial preparation, 756
Vitaceæ, 629
Volatile oils, adulterations, 736
estimation in alcoholic solutions, 737
spices, 737
examination, 731
Volumetric indicators, 762
Vote of Thanks to Chairman of Committee on Membership, Citizens of Richmond, the Local Secretary, and the Committee of Arrangements, 80
Joseph P. Remington, 30
The ladies of Richmond, 81
retiring officers, 82
Vulcanized fibre, 787

W.

Wagoga arrow poison, 663
Wakambo arrow poison, 663
Walter, Chas. A. Proximate Analysis of Eupatorium perfoliatum, 216
Wartara oil, characters, 575
Water, bitter almond, 428
bitter Scharatiza, 430
bromoform, 429
camphor, 429
carbonic acid, oxygenated, 42
cherry laurel, 428
chlorine, 429
distilled U. P. preparation, 679
precautions in examination
removal of unpleasan odo

Water, drinking, algæ cause for contamination, 678
erythrosine, as alkali indicator, 676
estimation of alkaline earths, 677
filter, handy, 403
-kefir, preparation, 539
lime, preparation, 481
unsatisfactory condition, 481
ozalin, 555
potable, sterilization with chlorinated lime, 677
-pump filtration, 402
rapid method of purification, 677
taps, splash preventer, 417
Waters, artificial mineral, 430
bitter, comparison of, 430
medicated, 426, 427, 428
toilet, 514
Wax, bees, Italian imitation, 669
with rosin-like taste, 669
Japan, advantage of, 669
Pisong, composition, 669
sealing, insoluble in alcohol, 541
yellow, adulteration, 669
Waxes, floor, formulas, 542
Weighable burette, 391
Weights and measures, metric, 386, 387
Russian, 387
West African drugs, 561
What representative pharmacists and physicians say about plasters, 202
Whelpley, H. M., election as local secretary for 1901, 59
resignation as member of Council, 59
Wild cherry bark and its preparations, 207
deterioration by age, 640
syrup of, 518
acetous, 518
Williams, Seward W. What Representative Pharmacists and Physicians say about Plasters, 232
Wine, calcium glycerophosphate, 488
detannated, 535
removal of mouldy taste and odor, 629
Wines, alcohol-free, 629
cinchona, 536
Wintergreen oil, synthetic, advantages of, 760
Wood naphtha, tests of quality, 771
palo-balsamo, 621
pulp poultice, 434
tar creosote, composition, 774

Y.

Yeast, biology, 570
Yellow wax, adulteration, 669
Yucca filimentosa, examination, 578

Z.

Zinc, carbonate of, cream, 438
chloride, solution of, from oxide, 488
solutions, turbidity on diluting, 717
dusting powder, 501
electrolytic determination in preserves, 718
salicyl dusting powder, 501
volumetric estimation, 717
Zinol, 559

BIOLOGICAL &
MEDICAL SERIALS

Proceedings of the American Pharmaceutical Association (1900)
BIOLOGICAL &
MEDICAL SERIALS

Restricted Book

The borrowing of this book is subject to the restriction as checked below.

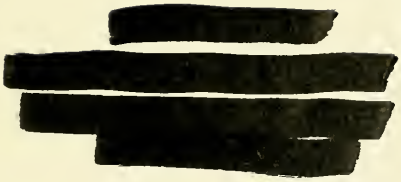
1. ✓ May be used only in the library–not to be withdrawn at any time.

2. May only be withdrawn from 4 P.M. until 9 A.M. of the following day.

3. May be borrowed for a period of 24 hours.

4. May be borrowed for a period of 7 days.

[redacted]
BIOLOGICAL &
MEDICAL SERIALS



BIOLOGICAL &
MEDICAL SERIALS